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GAS LIGHT JOURNAL

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[OFFICIAL NOTICE.]

Western Gas Association.

SECRETARY'S OFFICE, QUINCY, ILLS., April 9, 1887.

The Tenth Annual Meeting of the Western Gas Association will be held at St. Louis, Mo., on the 11th, 12th and 13th days of May. The rates at the Southern, fixed upon as the headquarters of the Association, will be $3 and $3.50 per day.

The prospects for the best meeting ever held by our Association are all of the most promising nature, save in one important particular. The attendance will surely be large; a flattering number of applications for membership has already been received; the hotel and hall secured by our Local Committee of Arrangements are all that could be desired; the social features of the programme will be a treat such as one seldom enjoys, and yet there is one attraction thus far lacking, although I have not quite abandoned hope that the want in question may yet be supplied. I refer to the paucity of papers so far promised. With each succeeding annual meeting it appears more and more difficult to induce members to prepare essays for our Association's entertainment. I had hoped that I might be able to announce in the next issue of the JOURNAL a satisfactory array of titles, but unless a goodly number of our members at once comes to the rescue, it is only too plain to be seen that I am destined to disappointment. I do not see how I can more strenuously urge the importance of this matter upon the attention of those most interested. Frankly, I am a little disheartened at the apathy displayed in this particular; but, even at this comparatively late day, there is still time to make amends, if our contributors will only settle down to business.

In the matter of reduced railway fares, the intricacies and complications which have been thrown upon the question by the alleged mystifying provisions of the Inter-State Commerce Bill, still remain unraveled, and I fear will remain in this discouraging state beyond the date of our meeting. If, however, a favorable conclusion is reached in time for action, your Secretary will promptly forward the necessary certificate to every member whose name appears upon our roll book.

A. W. LITTLETON, Sec'y.

OBITUARY—JAMES H. WALKER, SR.

Our item columns for March 16th contained a few lines conveying the sad news of the death of Mr. Jas. H. Walker, Sr., whose demise occurred, on the first of that month, at Tonawanda, N. Y., at which place he had some months prior to the end of his busy and eventful life attached himself to the service of the local gas light company. Faithful to his chosen profession to the last, of him it may be said that he literally died in harness. As the subject of this sketch occupied a decidedly prominent position in the ranks of the gas fraternity of this country for many years, and withal was one of those who never sought obtrusively to attract attention to himself, but sought to advance the standing of his art in a quiet and persevering fashion, we believe a short history of his life will be read with interest by his former associates and co-workers.

Jas. H. Walker was born, in 1827, in the pretty Scottish seaport town of Montrose, Forfar county, where he imbibed the rudiments of a com-

mon school education, subsequently taking service with one of the working iron masters with which his birthplace abounded. Coming of age, he decided to try his fortune in North America, and next we find him, in 1848, in Quebec, Canada, where he took part in the erection of the gas works for that city. When the Quebec plant was completed Mr. Walker became interested in the construction of some three or four Canadian gas ventures, subsequently (in 1857) leaving Hamilton, Canada, for the United States, New York city being his first stopping place. He engaged here temporarily with a firm of constructors of gas works apparatus—we are unable to give the names of those who owned the establishment—and shortly thereafter took service, under Mr. J. K. Brick, in the works of the Brooklyn (N. Y.) Gas Light Company. We next find him in Hartford, Conn., superintending the gas works at that point, where he remained until about the close of the War of the Rebellion. Fort Wayne (Ind.) next claimed him as a resident, in which place he had charge, for a time, of the local gas works, but resigned those duties to accept others, which resulted in the formation of the business now conducted under the title of the "Kerr Murray Manufacturing Company." In 1869 the proprietors of the Milwaukee (Wis.) Gas Light Company offered him the position of Engineer and Superintendent to their works, which he accepted. He remained there for something over nine years, during which period his services as a consulting engineer and constructor were in constant requisition. Among the new plants constructed by him about that time were those at Moline, Ills., Sheboygan, Wis., and Winona, Minn. In 1876 he was afflicted with a severe eye disorder, and the medical treatment which he underwent for the relief of that attack laid the foundation for the still graver disorder that finally closed his career. Although far from enjoying even fair physical health, 1881 beheld him in the service of the Citizens Gas Light Company, of Rochester, N. Y., but the pressure of his duties there compelled him, about 1885, to resign the position. Idleness, however, seemed to him to be a greater burden than the depressing effect of sturdy labor, coupled with failing bodily frame, and in September, 1886, we discover him once more in harness as Superintendent of the Tonawanda (N. Y.) works, at which place, as before noted, on March 1st, he calmly surrendered to the fiat of nature. He had been, since the fatal treatment of 1876, a severe sufferer from that most distressing and disheartening of bodily ailments—partial paralysis; but his rare patience and sturdy fortitude during a decade of years afford a key to the character of the man. Deceased was buried in Rochester, N. Y., on March 4th, the ceremonies of interment being in charge of the Scottish Society of that city, of which organization he was a charter member. In fact deceased ever took an ardent and practical interest in the workings of Scottish social and benevolent associations wherever his business pursuits obliged him to locate. The survivors of his immediate family comprise wife, two sons and a daughter, who sorrow greatly for a true husband and an affectionate father.

Deceased was elected to active membership in the American Gas Light Association on the occasion of the second semi-annual meeting held in Cleveland, Ohio, on May 13, 1874, and took a lively interest in the success of that organization. Perhaps one of the most noteworthy papers ever contributed to its sessions was his dissertation on the abolition of Sunday labor in gas works, which was forwarded by him to be read at the meeting held at Brooklyn, in October, 1874. The standpoint taken thereon by the author was somewhat novel to the majority of the fraternity, but its sentiments certainly elicited their hearty commendation. In fact a marked point in the career of deceased was his evident desire to ameliorate as far as possible the condition of those who labored under his supervision. He was a careful and safe engineer, and watched conscientiously over the interests of his employers. Although some claimed or averred that his policy or method was over-conservative, it is nevertheless true that he was among the first of his time to abandon the use of iron retorts in this country. Certainly, he equipped the St. Catherine, Canada, plant with clay retorts in the year 1853.

However, over-conservative or not, accordingly as the fancies or opinions of his contemporaries may sway them, the life of deceased presents a history of earnest labor and modest bearing that will cause all to join in regretting the demise of one who ever practiced as he preached. From an acquaintance with deceased that extended over many years, the writer bears truthful witness to the late Mr. Walker's merit as an engineer and to his worth as a man; and can conscientiously say that among all the billowy marks which cover those who sleep within the precincts of Rochester's resting place for the dead, no one conceals the remains of a truer, kindlier gentleman than that heaped up over what was once the frame of Jas. H. Walker, Sr.

Henry Bower, of Phila., Pa., having failed, it is likely that the five-year contract under which he controls the ammoniacal liquor product of the city gas works will not hold.

DEATH OF MR. H. H. FISH.

We were greatly shocked at the recent fateful intelligence conveying the fact that Mr. H. H. Fish, Treasurer of the Utica (N. Y.) Gas Light Company, had departed this life. Our details of this sad occurrence are quite meager, and simply go to show that his death, which was quite sudden, transpired something over a fortnight ago, it is presumed, at his former home in Utica. Mr. Fish was probably about as well and widely known as any other member of the fraternity in this country, and had been connected with the Utica Gas Light Company as Treasurer, and General Manager, since date of July 1st, 1851. Although well advanced in years, deceased preserved an activity of mind and body superior to many of his contemporaries of lesser age, and his brethren of the fraternity, especially those who counseled with him, will keenly feel his loss. Deceased was admitted to membership in the American Gas Light Association at the third semi-annual meeting, held in Washington, D. C., on May 12th, 1875, and was a faithful attendant at its subsequent gatherings. Communications from his pen often appeared in our columns. We hope at another time to present a short sketch of his life. The following is a copy of the resolutions passed to his memory by his former associates in the management of the Utica Gas Light Company:

"The Trustees of the Utica Gas Light Company, at their meeting held this second day of April, A. D., 1887, note upon the minutes, with profound regret, the death of their Treasurer, H. H. Fish; and to his memory record the fact that the Company has lost an officer to whose energy and ability its success was mainly due; the Trustees a friend and co-laborer, whom they loved and admired; the community a man who was respected and esteemed. W. S. Doolittle, Secretary, *pro tem.*

PUBLIC LIGHTING IN NEW YORK CITY.

The Gas Commission, consisting of the Mayor, Controller and Commissioner of Public Works, met in stated session, on March 30th, to open bids and make awards for the public lighting of this city for the ensuing lighting year, which begins on May 1st. With the knowledge that Mr. Wm. R. Grace, our esteemed ex-Mayor, would not have the privilege of awarding a fat slice of the contract to his associates in the electric lighting companies, it was expected that all would not be plain sailing for these hitherto exceptionally "lucky" dispensers of variously-numbered high-power arc lights to the municipality. That expectation was verified in some measure, as the action of the Commission shows. The following bids were made by the gas companies:

Consolidated, $17.50 per lamp per annum; Mutual, $17.50; Equitable, $12; Central, $28; Northern, $30; Yonkers, $30; N. Y. & N. J. Globe (naphtha), $25. Awards, at the bids, were made to the four companies at top of list—the Equitable folks being authorized to maintain all public lights reached by their mains. In round numbers these approach a total of 2,500 lamps. The Yonkers, Northern, and Globe proposals were referred to a future meeting, which takes place to-day (April 14th). The Globe Company now maintains about 120 naphtha lanterns in what is known as the Woodlawn district, and the contract will probably be renewed at the bid price of $25 each, which rate has prevailed for the service for some years. It is surmised that the Northern and Yonkers Companies will, in compliance with the Mayor's suggestion for a reduced rate, reduce their bid slightly, say, to $29 per lamp; but in consideration of the peculiar circumstances attending the public lighting supply conditions in their respective districts, we think the $30 proposition is not at all unreasonable.

The bids submitted by the electricians were somewhat different to those which prevailed during the Grace *regime.* Hitherto the Brush and the United States Electric Light Companies worked in harmony, in that they divided the city between them. Fourteenth street, running east and west, constituted the dividing line, the Brush folks taking the northern and the United States the southern division of the territory; and while that arrangement was not disturbed this year, the bids were slightly diminished, as also, at least by the United States Company, the candle power. The United States asked 65 cents per night for lights of 1,000-candle power, but the Brush people stuck to the 2,000-candle farce, at a price similar to that of the first named Company. Ever since the electrical promoters managed to secure a grip on the treasury of the city they have received 70 cents per light per night, or a yearly payment of $255.50 for every public arc maintained; but Mayor Hewitt seems disinclined to grant them their former privilege, and their proposals were held over until the meeting set for to-day. This will occur at too late an hour to permit us to report the result in our present issue. The United States proposition seems to us—if there is any merit at all in the way in which electric arc lighting value is "determined"—to be of the decidedly "cheeky" order. Even the city of Brooklyn, where the electric lighting is under control of the staunchest and most prominent of the political ring in power at that point, obtains 1,000-candle power arcs at the rate of 50 cents each per night. Again, the North New York Lighting Company, at the March meeting of the Commission, offered to supply (in the Harlem section) 2,000-candle power arcs for 55 cents each per night; while the Harlem Lighting Company offered to furnish similar service at 48 cents. The last named Company also offered to supply 16-candle power incandescent lamps, provided the present gas lamp posts could be used as supports, at the rate of 5 cents each per night. All the electric bids were referred. We will, in our next, state the final outcome.

[Official Report—Continued from page 216.]

Third Annual Meeting of the Ohio Gas Light Association.

Held at the Beckel House, Dayton, Ohio, March 16 and 17, 1887.

First Day—Afternoon Session.

*Discussion on the Graeff and Wood Papers.**

The President—You have heard two papers upon the same subject which do not differ greatly in their sentiments. We would like to have them thoroughly discussed.

Mr. Jones—I suppose, since all here seem to be practical men, that neither theory nor faith will amount to much. What we do want, however, is experience. I understood Mr. Wood to say that they have operated an electric plant in connection with the gas works at Sandusky for a year. I would like to know what has been the result, as to profits and success. In smaller places, for example in Middletown, I understand that the electric lighting of the streets costs the city $5,000 per annum. It is done by an independent electric light company. On that basis, I am assured by a stockholder in the electric company, the scheme does not pay at all. I disremember the number of lights maintained.

The President—Will Mr. Wood tell us whether it paid or not. From the tone of his paper I should infer an affirmative reply.

Mr. Wood—I will not say how well it paid; but our directors are all very well satisfied, as are the stockholders and myself.

Mr. Jones—The two paid in combination?

Mr. Wood—Yes; paid better than would have been the case if the electric light had been put in in opposition to the gas company.

Mr. Huntington—Was your charter amended so as to enable the gas company to furnish the electric light?

Mr. Wood—The electric lighting portion of the Sandusky Gas Company's business is conducted by a separate organization, but the stockholders in the former are also stockholders in the latter.

Mr. Graeff—I would like to ask Mr. Wood how many arcs are supplied?

Mr. Wood—About 100.

Mr. Graeff—And the stockholders reap a profit?

Mr. Wood—We have not yet run any one month when the profit earned did not amount to ——† per cent. per annum.

The President—Mr. Wood's reply certainly shows that electric lighting can be done at a profit in Sandusky.

Mr. Ramsdell—I would like to ask Mr. Wood what price his Company receives for each arc light.

Mr. Wood—Each single commercial lamp burning until ten o'clock is paid for at the rate of $35 per month; $40 is charged for those that are extinguished at midnight. We receive $90 per annum from the city for each street light maintained in accordance with what is known as the Philadelphia schedule. I may also say that we are still under contract to light the city with gas, which contract does not expire until August next. The public arc lights mentioned are all in the districts formerly lighted by gasoline, therefore a clear gain. We would not have got those if we had not adopted the combined plan.

Mr. Dickey—I would like to inquire as to the cost of the posts described in the paper.

Mr. Wood—We make them ourselves; they cost us $7 each.

Mr. Jones—How did the introduction of electricity affect your gas output? Was the latter increased or diminished?

Mr. Wood—The total sendout showed a very slight increase. I call it virtually the same. The electric light is an addition. Of course we look for an increased sendout of gas next year.

Mr. Light—Did I understand that you got $90 per year for each public arc light?

Mr. Wood—Yes; running until midnight. The circuit in the former gasoline district was a very long one, and we got a favorable contract, to last for three years, on that account.

Mr. Bushnell—Springfield has had an electric lighting plant for something over three years, and about 56 public and 50 commercial lamps are supplied by it. The charge for each street lamp is $130 per annum. They are lighted 30 minutes after sunset and extinguished 30 minutes before sunrise every night in the year. We (the Springfield Gas Company) are required to maintain our gas lamps during similar intervals, which means an annual lighting duty of 3,750 hours. The electricians displaced about 200 gas lamps, or not quite 4 posts to an arc light, which shows that we, with gas, charged but $80 per annum for lighting a section now lighted by electricity at an annual cost of $130. That proves there is no particular economy to the city in the electric light. For the commercial lights they charge $12.50 per month. The proprietors of the Springfield Electric Light Company have not been so successful in the item of profit as Mr. Wood's Company has been, because they desired this year to sell out to the Springfield Gas Company, for the reason that electric lighting did not pay them a profit. We did not buy, but they have now made a new contract, which they think is more favorable than the old one, with the city, and they will increase the number of lights, provided the City Council think it proper to do so. The consumption of gas has increased somewhat since the introduction of the electric light; but I think we would have now had a considerably larger consumption, by reason of the natural or normal increase, if an electric light company had not been organized in our city. Our authorities have adopted a different plan from that spoken of by Mr. Wood—I mean as to extending the electric light out into the outskirts of the city. Our authorities only put the electric light in the business portion of the city, and require the Gas Company to extend mains to and put up posts in the suburbs—not a very desirable thing for us. They have required us, or under our contract may again require us, to extend mains and erect posts out beyond the line of electric lights, so that this has given us the same number of lights that we had originally; perhaps a few more. However, as Mr. Wood stated in his paper, the street lighting is not very much of an object to a gas company, for I think the profit therein is very small. The directors of our Company, when the proposition was made to combine the electric light plant with the gas plant, took a rather different view from that expressed by the gentleman who read the first paper. Our folks thought that if they controlled the two systems of lighting the cry of monopoly would at once be heard, and they would have the same trouble that they had before; therefore, they preferred, at this time, not to join the two together. I am glad we have been enlightened to some extent in this matter by these two papers. I think I entertain somewhat similar views to those advanced in them. In our place, as soon as it should become known that the electric light company was controlled by the same parties who controlled the Gas Company, there would be the same dissatisfaction, and the same desire to organize a new company—either a new gas company or a new electric light company; and our directors thought it would be better to compete with one company than with two or three—especially so when the present electric light company is in the hands of our own citizens, with whom we are friendly. It is better for the Springfield Gas Company to have it run in that way than to seek to unite the two interests; at least that is the way we feel about it. We may be wrong in our interpretation of the idea, but such is the conclusion of our board. Our contract prices for the next five years having been fixed, we feel very comfortable as to the outlook for that period, although our gas plant does not make the profit that Mr. Wood reaps on the electric light plant at Sandusky. In fact we cannot come anywhere near it. We get a little more for gas in Springfield than they do in some other cities; but, taking the population and output into consideration, I think we are furnishing gas very cheaply. It may be of interest to you to know that the price of gas is fixed for the next five years at $1.50 per thousand cubic feet. That is the price charged to private consumers, and also to the city outside of the city limits proper. For street lamps the price is about the same as in Dayton—$20 per post, burning all night and every night; but we do not consider that there is very much profit in that.

Mr. Bierce—What is your population; and what is the output of gas?

Mr. Bushnell—Our population is about 35,000, and the annual output (as I remember it) is about 45 millions cubic feet. I am sorry I cannot say anything that would be of particular interest to you on this subject of combining and operating the two plants (gas and electric) in common. We are getting along in a very friendly way with our competitors, and if they do not attempt to crowd on the incandescent light for street lighting, we shall have no reason to complain. As far as I can understand, from observation and report, they have not been very successful in other places in attempting to light streets by the incandescent method.

Mr. Dickey—Does your contract extend for five years with the street lamps as well as the others?

Mr. Bushnell—No; it does not. The gas rate is fixed by ordinance; but the contract for street lighting is made from year to year, still the price is fixed so that if any additional lamps are used there is no question about the rate of payment for them, and there is no coming up of the question as to a change of price. The all-round price is fixed for a term of five years; and in the matter of supply to private consumers, that practically amounts to a contract by the Company that it shall not charge a higher sum during the period agreed upon.

Mr. Dickey—That has been recently fixed?

Mr. Bushnell—Yes; within the last two or three months. Various propositions were made to our City Council in regard to lighting the

* For Papers, see issue April 2, 1887.

† Mr. Wood named the figure, but desired that the same be not published.

streets; but after considering them all they concluded they had better continue the contract with the old company. We made the contract, and they fixed the price.

The President—I think Mr. Gwynne can tell us something about electric lighting.

Mr. Gwynne—I have had very little experience in that line. We have an opposition or electric company in our town; but we have had nothing to do with it in any way, shape or manner. They are simply a rival company.

Mr. Wood—You ought to "stand in" with them.

Mr. Gwynne—I have at times felt that I would like to "stand in" with them.

Mr. Graeff—If you want some figures on this subject I can give them to you, but without naming the writer.

The President—You will vouch for their authenticity, I suppose?

Mr. Graeff—I will mention the name of the writer, if you will agree that it shall not appear in the report. It was a name read this morning in answer to an invitation to attend this meeting. He is connected with a Gas Company now running an electric lighting plant. The letter was written to me March 3d. He says: "The plant was started about the 1st of December, 1885, so that we have now been running a little over a year. Last spring, about the 1st of April, we had 34 lights, and we now have 60; and for the year ending the 1st of April we shall more than pay running expenses, but not enough to make the Company whole of its investment." The way he figures running expenses is as follows: "I estimate that when we can clear 16 per cent. on the actual capital invested above the running expenses, that we shall lose no money. That 16 per cent. I divide as follows: 6 per cent. for interest, 8 per cent. for depreciation, and 2 per cent. for office expenses; and, at the prices that are charged here, that amount of money can be made (at least I think it can) when we have 80 or 90 lights. We run by water power, paying $1,000 per year for power sufficient to drive 70 divided arc lights of the T.-H. pattern. I employ one man who runs the dynamos, and who makes the extensions of wire, repair of lamps, etc., and a young man who takes care of carbonizing these lamps. The total cost for labor is about $1,150 per year. The average receipts for lamps is $75 each. The dynamos are stopped at 12 o'clock each night." He anticipates that he can increase the number of lamps without additional expense. When he adds ten more lamps, which he has the present capacity to do, as regards power and labor, he will add $750 to his receipts with very little increased expense except the cost of the additional carbons. He says he nets 16 per cent. on the actual capital invested; paying 6 per cent. on his investment as interest, he will clear, at the lowest calculation, 10 per cent. more than that, and allow a little extra for extra depreciation. That is the report from a good, solid gas works in an Eastern State. I think if Col. Stedman were here he would give you some more instances of the same kind. I had the pleasure of going over some figures with the Colonel, in connection with the President of his new company, and if he were here he would have figures to present to you; but he might consider it a breach of confidence if I gave those figures without authority. I would like to say, before this discussion closes, that at the last October meeting, in speaking of incandescent lighting, the superintendent of a gas works in a Pennsylvania town who has been competing with the Edison incandescent lamp for about two years, told me that they were now lighting the streets with the Edison incandescent, and that his output had been decreased one-third in consequence of his fight with the incandescent lamps. That is the only case of which I positively know where a gas company has directly lost in output by reason of such competition.

The President—Do you know what the price of gas was?

Mr. Graeff—I cannot say, but I do not think that it was too high. He lowered the price of gas. I know he introduced the Albo-carbon lights in a great many cases without making any charge for them. After doing everything in his power to hold up his end of the fight he told me, last October, the result had been that he had lost one-third of his output. That is a matter, I think, for serious consideration. I will say, however, in all that I have heard and seen of the system, his was the only case of that kind which came to my knowledge.

Mr. Bushnell—Did you mention the cost of a plant for 50 lights?

Mr. Graeff—I did not; I have not got the cost. I said the cost of the water power in this instance was $1,000 per year, and of the labor, $1,150 per year; but that gave a capacity for fully ten more lamps than they have. Further, that with the lamps at present in use the Company had paid expenses.

Mr. Bushnell—They had a great advantage in having water power.

Mr. Graeff—Certainly, they had an advantage there; but they had the disadvantage of running a smaller number of lights than their capacity warranted.

The President—I think Mr. Coverdale can give us some information.

Mr. Coverdale—I do not know that what I can say about the subject treated of in those papers will interest you; but I believe every gas company in the country will sooner or later have trouble from the competition of electric light, and had better prepare themselves for it. I was much annoyed last year by opposition directed against a gas works owned by me at Rome, Ga. First of all the water gas agitators stirred me up. They said to the citizens they could make gas for about 18 cents per thousand; that they could put up water gas works and, by means of a separate main, furnish gas for fuel cheaper than natural gas; and that they could supply gas for illumination a good deal cheaper than we could furnish coal gas. I succeeded, without any great effort, in spoiling their game; but when it came to the electric light I encountered quite a different thing. Our contract with the city does not expire for nine months, but the authorities decided to annex an outlying village, thus adding another ward to the city. The villagers were told that their streets would be lighted by gas, but it would require us to lay a mile of pipe in order that the place might be lighted. About 20 lamp posts would be fed from that new line. The electricians then came before the Council and said: "We will light up that little village with electric light, which will give you five times as much light as you can get from gas (at less cost, too) on condition that you pay us $120 per annum for each arc, and then contract with us to light the rest of the city with arcs. Twenty of these will do the work, and the city will be far better illuminated than it is at present with gas, and at no greater expense." I failed to understand that, of course; and I went right down to Selma, Ala.—not a great way off—for information on the subject. The Superintendent of the Selma gas works (he is a member of this Association) said: "We have now got 37 arc lights, and they formerly paid us $2,688 per annum for 112 gas lamps; but now they pay us $3,700 for the arc lights, and $900 for gas lamps"—it costs Selma about twice as much to light up the town as when they used gas—"but," he added, "they cannot get along without it, for we will get about 20 additional lamps next month, because they are going to increase the lighting area once more." I did not want to propose to put in a plant to light up the new Fourth ward in Rome, and I did not want to say anything about putting in a plant to light our city. I thought the less said on that score the better for us; but I wrote to several places where they were using the arc light for street lighting—I did not write either to the gas companies or the electric light companies, but communicated with the property owners of the various places—and received replies from every one. There was not a single reply that favored lighting with the electric light. In fact all were indicative of dissatisfaction with the light. Of course, I laid those letters before the City Council. Last night (March 15) was the date set to determine whether the city would be lit by electricity or by gas. At the meeting I made a proposition to light up the streets with gas, if they would give us a three-years' contract—we now have 88 lamp posts, and are paid $2,400 per year for them—and increase the number of posts to 125, for the sum of $26 per post per year. I agreed to lay one mile of pipe to the Fourth Ward, and to put up lamp posts on every 210 feet on that new line of pipe. The electric light folks were first heard by the Council, but we succeeded (not exactly in defeating) in inducing them to withdraw their proposition. Then our proposal came up before the Council; and I am pleased to tell you that our terms were acceded to. We now have the contract.

Mr. Allison—Perhaps Mr. Coverdale, before he gets through with the contract, may meet with an experience similar to mine. Do you light and extinguish the lamps?

Mr. Coverdale—Yes.

Mr. Allison—Last December the Xenia City Council passed a resolution asking for the better lighting of our city. They had been using arc lights for five years, starting them in January, 1880. The citizens, however, became so dissatisfied that they asked the Council to see if the city could not be better lighted. I made a proposition about a month ago on behalf of the Xenia Gas Company, which was accepted by nine of the twelve members of the Council, and the City Solicitor was directed to draw up a contract in accordance with its terms. One of the three who voted against it—being a pretty old sore head, and who was, in fact, instrumental in determining the Council when the electric light was originally put in—succeeded in inducing a Common Pleas Judge to sit down on the City Council by forbidding them to carry out the new contract. Perhaps Mr. Coverdale may have the same experience before he gets through. The case will come before the Court on Monday, March 21st, for possible final settlement. I do not like the looks of it, and I do not know what the result will be, because the gas company is forbidden even to be a party to the suit. It is in reality an attempt to prevent the President and Clerk of the Council from signing the contract.

Mr. Coverdale—Perhaps I ought to add to what I have said about the

electric light at Selma, that I have a letter which states the cost of the plant used to light up that city was about $15,000. They borrowed $15,000 to pay for it, but the writer of the letter is satisfied, as he assured me, that they can pay the current interest on their investment, and get their $15,000 back again out of the earnings of the electric light supplied within a period of six years. Let me tell you about another gas company in which I own some stock. Before the advent of the electric light in the town referred to I got a 10 per cent. dividend. The electric light folks have been there for three years, and since their appearance my dividend return has been 4 per cent.

Mr. Light—What does that electric light company get per lamp?

Mr. Coverdale—$90 per year.

Mr. Alexander—An electric light plant has been located in the town of Painesville during the past year. It was introduced by a company entitled "The Globe Electric Lighting Company, of Bucyrus, Ohio," but they seemed to have dropped out of it, for it has passed back into the hands of the Western Electric Light Company. They have 55 arc lights on the streets, in consequence of a contract for one year with the city, made when they put up the plant, for which they were to get $6 per month per light. Two weeks ago the Common Council renewed that contract for another year. When the plant was put in the owners offered to sell it to the city for $13,500. They had an engine, but no boiler. They bought their steam from a manufacturing establishment. Their income from the 55 lamps, at $72 each, is $3,960 per year. I have tried to find out what their running expenses would be, and secured my information from many sources. To start with, they paid $1,400 for steam. They had a building (put up by a man who owned the lot next to a manufacturing establishment) for which they pay $150 per year rent. Their carbons cost about $450 per year; superintendent, $360; engineer, $540; carbon man, $360; for oil and waste, $40; for globes broken during the year, $40; and as they had not lived in Ohio long enough to know how to fix their tax bills, they paid $275 on that account, making a total of $2,615 per year; not including any extraordinary repairs. That would leave them a profit of $345 per year on what they claim is an investment of $13,000.

The President—We have a good many meter men in our assembly, and we are curious to hear what they can say in favor of electric lighting. We would be glad to hear from Mr. McDonald.

Mr. McDonald—I do not know why the President should call upon a meter man to discuss this subject. We do not measure it; therefore we oppose it. I think, however, from what I have gathered at the different meetings which I have attended (I was at the Boston meeting of the New England Association last month) and from general conversation with gas men, that there is money in electric lighting, when the business is handled by a gas company. I think I can say so with some degree of confidence. As to whether it is always policy for a gas company to undertake to run an electric plant, I do not presume to judge. Some say yes to that; but others say no. We have heard this afternoon from two very good representatives of these two opinions—Mr. Wood who, read the paper, and Mr. Bushnell from Springfield. I have about come to the conclusion that the electric lighting business is something gas companies cannot afford to laugh at. They must consider it carefully and seriously. Electric lighting, as many have already said, has come to stay; and I think the day is coming when the incandescent light will be the great competitor of gas lighting. I do not believe that gas companies have very much to fear from the arc light competition with their business—at least, not for house or store purposes. My experience in our city (Albany, N. Y.) is that the arc light is always removed from a store after being in for a time. We have had the commercial electric light for five or six years; but find that it does not stay long in any one place. It changes constantly. They have a few customers, but these keep changing all the time. For street purposes, however, it seems to be a permanency. The incandescent light in my opinion is the coming factor in the lighting business. I begin to hear stories to the effect that the incandescent light can be produced at a very low figure. We heard those stories a number of years ago about the arc light, and were loth to believe them; but still it has come to the fact that more light, candle for candle, can be produced by electricity than can be produced out of the coal when made into gas. I can only say I think it wise to consider the matter carefully, to look into the electric lighting business, and thus make up your minds whether you want to go into it or not.

Mr. Gwynne—I would like to ask Mr. Graeff a question. He speaks of a gas company in Pennsylvania losing one-third of its business by reason of the introduction of the incandescent light. Does he know at what price the incandescent light was furnished?

Mr. Graeff—I do not. The Edison Company went in there and made a strong fight, which lasted for two years. I do not care to mention the name of the company, because the Superintendent might not like it; but I will tell the name to any one who desires after the meeting is adjourned. It was not given to me as a secret, but still I would not like to advertise the fact. He said it was seriously hurting him, and he gave that as the extent. I have not heard what the Edison incandescent light is being furnished at, but it is supplied at a very low figure, I am confident. They also claim to be paying expenses; and, not only so, but I think the Gas Company admits that the Edison Company is not losing money. It is my impression that they so believe.

Mr. Converse—I would like to hear from Mr. Bates on that point.

The President—Mr. Bates is present at the meeting, but I do not see him in the room. We would like to hear from Mr. Printz, of Zanesville.

Mr. Printz—I do not know that I can give any information on the subject. We have in our place at present about 90 arc lights, furnished under the system of the Western Electric Light Company, of Chicago—64 commercial lights, and probably 26 street lights. They receive $80 per year (lighting by the moon schedule,) for street lights; for store lights, burning until twelve o'clock, they get $25 for one light, or $23 for two lights. They allow a discount for those that are cut off earlier in the evening. At present they do not appear to, and do not claim to be making any money. They think they could, or say they could, if they got an increased number of lights. They claim that their plant is sufficient to supply 50 or 60 more lights than they are now running; and that the additional expense would be very little. The company have several times spoken to our people about taking the plant off their hands; and we have thought something about it. In the first place, we thought if we allowed this company to come in and establish the price, as they have done, the same feeling would not be caused as if the Gas Company took hold of it originally. Whatever price was fixed for the light by the electric light company could be maintained, if we saw fit afterwards to purchase the plant, and if the after circumstances would permit us to reduce the price a little we might thus secure the better feeling of the people. We have not yet come to a conclusion to do it.

The President—We would like to hear from Mr. Padan, of Portsmouth.

Mr. Padan—We have at Portsmouth a different kind of competition from any that I have heard spoken of. I think that Portsmouth is perhaps the best and cheapest lighted city in the State of Ohio. If other gas companies will meet such a competition as we did there, they had better look into the matter of going into the business themselves. The city does its own electric lighting. They utilize the water works, and have no engineer to pay. I think the plant cost $18,000. They claim that the expense of operating it, to obtain 96 arc lights, is but $3,000 per annum. They get $800 from the railroad. Last year we got $5,000 for lighting the city. The electric light is much superior to the gas light. I have heard a great many from other cities or towns say that they did not like the electric light; but that is not the case in Portsmouth.

The President—Did the water works pay interest on the investment since they run the electric light?

Mr. Padan—The water works never paid. They did not earn enough to pay interest on their own bonds.

Mr. Printz—I might say further, while the 64 commercial lights placed in our city have decreased our consumption in those particular stores, our increase of consumption in other directions has been considerable. Whether it is owing to the education of our people to the use of more light or not I cannot say; but we certainly have had a considerable increase in the consumption of gas. Our gas rate is $1.30; and that low figure may have had something to do with this increased consumption.

The President—We would like to hear from Mr. Ramsdell.

Mr. Ramsdell—Whatever electric street lighting is done at Vincennes is accomplished by the incandescent method. Our Company's contract with the city extends for a number of years yet, and the district supplied by the electric light people surrounds that embraced in our contract—commencing at the river and going around the city. Our city is pretty well lighted. We tried to do all that we could for the electric light people, and gave them all the corners that we did not have, so that the place is now very liberally supplied with lamps. For street lighting, however, the incandescent lamp is not a success; in fact it is very poor. The incandescent lamp used in Vincennes gives out a light which in no respect resembles a gas light. In color and intensity it very much resembles a little arc light. The filament gives out quickly. The lamps are guaranteed by the makers to run 600 hours, but I do not believe that they have ever had one which lasted that long. I have known lamps to be changed twice in the same month. When they are first put up they give a very pretty light. Being bright and brilliant, they look very nice; but in a very short time they begin to go down, more or less rapidly, changing to a reddish color, and finally flicker out entirely. Our

City Councilmen are rather friendly to the electric light people, and the rule requiring the police to report any lamps that might happen to be accidentally extinguished is strictly lived up to in regard to the Gas Company, while the electric folks are not so promptly looked after. One of their loops may be but a ghost of what it ought to be, still, if it is not entirely dark, it is not reported. We only ask for fair play in the matter. The stock of the company is owned and controlled by Vincennes citizens, and we do not do anything at all to antagonize them. We have no fear from the competition in our city. Our consumption has increased very materially; and I think that that increase is largely due to the reduction in price. At the same time we think that the electric light has helped our business. We know that it has, in some instances. As to the matter of price, which has been spoken of here, I think that is a very great consideration when we are talking about the electric light. I know, in our city, electric light is supplied at all sorts of prices. It would ruin our business if we undertook to do business on the same principle. They put in their lamps wherever they could, and got what they could for them, in very many cases. They started last October, and I do not think they have five lamps more to-day than they had when they started, which is a pretty severe criticism on the system.

Mr. Dickey—What system are they running?

Mr. Ramsdell—The Heisler, of St. Louis, Mo. In some respects it is very good, while in others it has very serious defects. They get $2 per month, or $24 per year per light, for street lights.

Mr. Dickey—It is not equal to the Edison?

Mr. Ramsdell—No; I do not think so; but perhaps I am not competent to judge.

Mr. Bushnell—I would like to ask Mr. Ramsdell how the prices compare as between electric and gas light, in the matter of street lamps.

Mr. Ramsdell—We have an unusually favorable contract with the authorities in respect of street lighting; perhaps some might consider we get a pretty high figure.

Mr. Padan—For how long is that contract to exist?

Mr. Ramsdell—It runs until 1900.

Mr. Gwynne—I have listened with a good deal of interest to what has been said on this subject. A plant was put in our place (Fostoria) a year ago last November. It so happened that it fell into the hands of the manager of the telephone exchange; but as he had no money with which to run it we made up our minds that the opposition would be unimportant, and, for that reason, we paid very little attention to it. In order to get a foothold he visited our best consumers, and offered to let them try the light for 30 days, with the understanding that if the service was satisfactory they were to pay a certain price—which rate was very irregular. As far as I could find out, if two lights were used in one place the price was $12, other parties using two lights were charged $14, and still others paid $18 for a like service. Those who did not readily yield to his proposals, in cases where he thought consent would be particularly harmful to the gas company, the lights were offered for little or nothing. Inside of 30 days he got orders for 21 lights, and took from the gas company consumers whose bills for gas each year would amount to $1,000. At the expiration of the trial month none of the lights were discontinued; but after that the service ran down somewhat, and three of the 21 came back to the gas company. We had no contract with the city for any specified time, and he eventually asked the Council to contract with him for nine public lights (his dynamo could support a total of 30 lights), and they authorized him to do the work for one year. The lights were to be extinguished at midnight; the total sum to be paid for the work was fixed at $900. The service has been indifferently performed, and the contract time will shortly expire; but he now proposes to do business on a larger scale, having recently asked the Council to contract for 32 lights (on a three years' agreement), at the rate of $75 per light per annum. If successful in this he will succeed in cutting out of our district an area which we hitherto have lighted by gas. A friend informed me that this genius now proposes to supply the incandescent light, and so far in his canvass has succeeded in obtaining orders for upward of 200 incandescent burners. Such has been our experience with the electric light. I believe he is backed by the home managers of the Brush Electric Light Company, who, I believe, wish to force us to buy him out.

Mr. Bushnell—It is very evident that the Fostoria electrical branch does not pay any return to those interested in it.

Mr. Gwynne—I do not think it does.

Mr. Critchlow—Following up the remarks of Mr. Graeff about the incandescent light, I will refer to a case not far from the eastern line of Ohio (it may bring to your mind a point worth considering) where the Westinghouse Company put in 800 16 candle-power incandescent lights; and in order to get consumers the lights were placed at the rate of 35 and 40 cents each per month. This resulted in taking away from the gas company about $4,000 per annum. The price of gas was immediately reduced from $2 to $1.50 per thousand. The electric promoters did not succeed in subsequently increasing the price for their light; and having started in at too low a figure, they soon ran behind; but, however, that did not prevent the cutting down of the gas company's receipts. The competition finally resulted in the purchase by the gas company of a controlling interest in the stock of the electric light plant, at the figure of $22.50 per share. These shares cost $50 each one year ago.

Mr. Christian—We at Norwalk have had quite a little experience in this direction. The same people who introduced the electric light at Painesville and Sandusky appeared before our City Council and succeeded in securing a contract (to last five years) for public lighting at the rate of $72 per year per lamp. With that as inducement they thought to organize a stock company and place a certain amount of stock among our citizens. Failing in that they put in the plant on their own account, fitting it out with three 30 and one 25 light dynamos and a 125 horse power engine. They started up in December, 1886, and managed to shake down their foundation in about a week's time. Then they stopped to make repairs, the city in the meantime authorizing the gas company to furnish gas for public lighting until repairs were completed. In 20 days they renewed operations, and have been running since, with the exception of one night when the lamps were out for about 45 minutes. They started in with 64 public and 22 commercial lights—I wish to say I think their light is as good as any that I have seen; but of course a good light is a certainty where plenty of power is supplied—but of the latter class only 11 were left, and of these they get paid for only four. The cause of the shrinkage in the commercial class was the expense. I do not think that constitutes a very good showing for an electric light company. I have looked into the cost of running that plant. Their labor account is very low (their superintendent is a councilman, who has not had much else to do for some years), and may average $2,500 or $3,000 per year. Recently I inquired of their coal merchant as to the probable quantity of coal he sold them—remember that they have a total of 75 lights in circuit—and from his reply I judged their coal bills represented about one-half of their income. It seems to me they were using up about two-horse power for each light; therefore, under the circumstances, the lights ought to be brilliant. Putting these things together I estimate that their annual expenditure for salaries, coal, taxes, repairs, etc., cannot be less than $5,000, and their receipts are, if anything, a trifle under that figure. I am certain they cannot figure out a single dollar of profit on the operation. The great idea with them was to get a footing in the town; and to compass that end they placed their prices at so low a figure as to preclude a profit on the investment. The gas company has no money to devote to the purchase of this plant, and be obliged to continue the losing contracts made by the promoters of the electric light company. Further, sooner or later they will have to give the task up, when, if we desire to purchase their property, we can do so on our own terms. No doubt we could do the work cheaper than it could be done by them. I think one great point has been overlooked in regard to gas. The results attained in electric lighting supply have been very great. If we may believe what we are told I think they claim to realize 90 per cent. of the power energy developed, and that not over 10 per cent. of the 90 is lost in the current transmission. Now, from our working standpoint we cannot begin to realize equal results, but it is nevertheless true that there must be a wide margin for improvement in the methods for consuming gas. See what a rapid advance has been made by the Lungren lamp, which, instead of 5 candles, enables us to secure 13 candles per cubic foot of gas consumed. It seems to me it will some day be possible to burn gas on the incandescent principle, and then we will surely get results superior to any yet attained. We ought to be able to secure temperature and effect equal to those attained in the incandescent light; and with that advance scored, we could count on decreasing the consumption of gas, per unit of light, by full 50 per cent. That would be equal to reducing your selling rate to 75 cents per thousand, provided your present rate was $1.50. Thinking of this possibility, and remembering that the electricians have about reached the highest attainable results under their mode of manufacturing the currents, not forgetting either that in the transmission of the current an increase of lighting intensity is only gained at a sacrifice in the life of their lamps, it seems to me that the future of the gas industry affords anything but a gloomy prospect.

Mr. Gemuender—I would like to ask someone interested in the joint supply of gas and electricity whether his profit in electric lighting has been gained at a sacrifice of his gas profit?

Mr. Wood—The profit in electric lighting at Sandusky has been clear gain.

Mr. Gemuender—What do you say about the gas?

Mr. Wood—Our companies—that is, gas and electric—have separate

organizations, with separate accounts. The only thing in common is the supervision.

The President—This has been a very interesting discussion, but we have probably devoted as much time to the subject as we can spare.

On motion of Mr. Huntington, a vote of thanks was tendered to Messrs. Graeff and Wood.

Mr. Nathaniel Kinsman, of Springfield, Ohio, read the following paper, entitled—

CHOKED STAND-PIPES: IS THERE A REMEDY?

Gentlemen of the Ohio Association:—Having promised our Secretary that I would give my views on choked stand-pipes, and attempt to suggest a remedy therefor, let me say that I had no trouble in finding plenty of "chokes;" but the discovery of a "remedy" is quite another thing. I know of but one way in which to prevent stand-pipes from choking, which is to run at low heats; but that is what no one is willing to do. During my experience of 30 years I have failed to see the stand-pipe that would not, at some period or another in its use, become choked; and I believe that so long as we run at high heats we will be troubled from this cause.

At one time, like a great many others, I thought if larger pipes were used a good effect might follow; but when, in our new plant at Springfield, we put in six-inch stand-pipes, I failed to observe any improvement over the old rule. Working under high heats a six-inch pipe will choke up as quickly as a four-inch one. Looking over the field I fail to be able to prescribe a remedy; but, failing a remedy, I may tell you how we clean out the "chokes" at Springfield. We use a bar of iron, two inches square, pointed at the end. Having heated the bar to as high a temperature as possible, we remove the stop and insert the bar. By turning the latter around the interior of the pipe a few times the tar is melted, and the pipe is speedily cleared. When the tarry deposit is burned so hard that the simple application of the bar will not start it, with the pointed end of the iron we work a small hole through the obstruction, then, allowing the stop to remain off, and not charging the retort, in two or three hours the pipe is cleared.

Discussion.

The President—Here is a question that we can all discuss. No man that has been long in the gas business can say he has had no experience with choked stand-pipes. I shall not think it necessary to call upon any one in particular to give experience in this matter.

Mr. Ross—I had too great an experience with choked stand-pipes a few years ago; but I now scarcely ever have a choked stand-pipe—certainly not over half a dozen in a year. The only change I made was to fix a device at the end of my hydraulic main, which permitted the tar to run immediately and continuously out, therefore I have a water seal at all times instead of a tar seal. I have followed that plan for many years, but before its introduction my stand-pipes were very bothersome. I use the same kind of coal, but am running at considerably higher heats now than I did before, or when the stand-pipes would choke up. As I advanced in gas making I found that high heats gave me better results, and so I kept them up. My idea was that the stiffer the seal the greater would be the back pressure.

The President—I think there are some present who work without any seal at all.

Mr. Light—About two years ago I adopted the adjustable seal—before that change we were much bothered with choked stand-pipes—and from the time of its adoption the trouble from that source was very slight. Now I do not average one choked stand-pipe a week. I account for it because of this movable seal.

Mr. Lindsley—At Cleveland we have 48 retorts operated with an adjustable seal. One-half of these have been running for 18 months, the remaining ones for perhaps seven or eight months, and, on account of the slight number of stoppages experienced, I might say that, practically, we are free from them. I do not recall more than two such happenings within the last six months. The gentleman at my right suggests that a possible reason therefor is the perfect fluidity of the water seal, that being a decided advantage over a seal in thick, tarry fluid. Perhaps the absence of a seal would carry this same idea far enough to prevent the formation of a carbonaceous or tarry deposit within the ascension-pipe. Possibly the pulsation of the seal, causing a continual hammering, so to speak, at some point in the pipe has something to do with the deposit. I offer that only as a suggestion. However, the fact remains since we have been working in this new house we have had almost no trouble from stoppages, whereas in our former the chokes were sources of constant vexation.

Mr. Hamlin—At Wilmington we have been very fortunate in regard to stopped stand-pipes. I am not sure whether such relief is traceable to the plan we follow for their prevention, rather than to the fact that we do not carry our heats to the degree followed by others. The rule we invariably follow after drawing each charge is to run a tool, having a projecting piece about an inch in length on its end, around the stand-pipe. Perhaps that is the reason why we are not troubled. At any rate, the plan is strictly carried out.

The President—Our Secretary has had some experience in this matter, and since he is so busy just now I will state it. He has no seal at all, yet I know of one section of stand, bridge and dip-pipe that was completely choked up; not only so, but the pitch in the main on half a dozen occasions, in as many months, was so great in quantity and strong in quality that three days were taken up in dislodging it. To take down dip and bridge-pipes at the Columbus works is not an uncommon thing; while a choked stand-pipe is as common a thing as hair on a dog's back. Some of the pipes are seven inches, while others are eight inches in diameter, and although the latter may not choke as quickly as the former, the stoppages will develop themselves in both in short order if you get your heats above a certain degree. That is our experience, stated as briefly as I could put it.

Mr. Gwynne—Working with low heats has been spoken of as a remedy for stopped stand-pipes. We started our new plant at Fostoria, Ohio, in November, 1884, and in less than three weeks the stand-pipes in one stack were stopped up almost solidly. During the time noted the heats were so low (the new material would not heat up) that it took us from 4½ to 5 hours to burn off 250-lb. charges. The stack alongside the bothersome one—retorts, pipe connections, and seal in main (one inch) being similar in both stacks—ran straight along for two years with very little stoppage, under the same conditions and with the same coal. The heats to second bench started out very much better than those under the first bench; and thus I found from my experience that high heats are not to blame altogether for stopped stand-pipes. In fact I might go further and say that low heats will cause them to appear more quickly than high ones. Certainly, our hottest bench gave us the least trouble. We have had some bother from tarry formations close to the mouthpiece of the retort, but none at the height of, say, three or four inches in the pipe. The trouble in the defective bench is not near so great now as it was formerly, for the heats in it are improving. Burning out seems to increase the frequency of chokes. Perhaps that operation does not completely remove the original incrustation. I think if the front walls of the benches are made heavy enough, and the pipes kept at a comparatively cool and equable temperature, we will have about solved the trouble.

Mr. Huntington—Appreciating the fact that brevity is the soul of wit, I wish to move a vote of thanks to Mr. Kinsman for that concise statement of his experience with stopped stand-pipes. Adopted. A recess, to terminate at 7:30 P.M., was ordered.

First Day—Evening Session.

The President—We have two papers on a kindred subject; we will hear them successively read in order to discuss them together. Mr. C. M. Converse, of Delaware, read the following on—

UNIFORM VS. SPECIAL RATES FOR GAS.

In assigning a subject I suppose it is usually intended that the arguer should take the affirmative; but I have assumed the liberty of taking the negative side of this question, and shall enter a plea for "Special Rates."

In contending for special prices it might be proper to ask what is meant by a special price. I mean a lower price, if possible, to large consumers; and also, *more especially* for day consumption used in gas stoves, gas engines and for manufacturing purposes.

There are several gas companies in the State of Ohio that have been enabled to make their uniform rate so low that it is virtually a special one. To such these remarks do not apply. And it is a further fact that *most* of the companies made the uniform rate *generally low*. But still there are certain large consumers who say they cannot afford to use gas as liberally as they desire at the uniform price. Being *wholesale* consumers, they ask for a *wholesale price*.

Increased consumption is one of the principal channels through which we hope to be able to make general reductions in the price of gas. That is the the goal which all gas companies are earnestly striving to reach; and in view of the sharp competition with which we now have to contend, it is necessary to strain every nerve, to watch every corner, and to keep every consumer, if possible, in order to attain the desired end.

Shall we try to secure a part of that increase by making concessions to these large consumers? Can we afford to lose them? or cause them to curtail their use of gas? But, would we lose them? Have we any competition to contend with? I would like to see the "Gas Man," of this

our day and generation, who thinks he possesses a monopoly of the artificial lighting business!

Is there any reason why we should not conduct our business in the same manner in which any other line of business is conducted? Would there be any injustice done to the small consumers in making special prices to the large consumers? I think not. On the contrary, they would be directly benefitted, in the end, by our being enabled to make general reductions, owing to our increased consumption.

The question might be asked, "*Would* the consumption *be materially* increased by making these special, or lower, prices? Our experience is that, in some of these special cases, the consumption has not only been increased, but the bills are as large, in dollars and cents, as they were before the reduction.

But my particular hobby is based on gas stoves and day consumption. We have had considerable experience with gas stoves, in fact I believe we are among the pioneers in that line; and we know how very materially we have increased our summer consumption through the use of these stoves. We could get them into more general use if the cost of the fuel were less, and greatly increase our summer out put by so doing. I intend urging our Directors to make a special low price for gas consumed in these stoves during the summer months. The objection might be raised that if we lowered the price for the summer months, it would be difficult to resume our regular prices for the winter ones. I do not apprehend any difficuly in that respect. I think our customers could readily be made to understand that, as our running expenses are nearly the same (excepting, of course, for material) when making only a little gas, in the summer time, as when running up to our full capacity in the winter time, we could afford to ignore some of the figures going to make up the cost of production, in fixing a price for these summer months.

The regular railroad fare from Delaware to Dayton is $2.20; yet the Railroad Company every year have large excursions to the Soldiers' Home, charging $1 for the round trip, or 50 cents each way. I don't think any reasonable person would say that because this excursion rate is 50 cents the regular fare should be the same; and I have never heard that the Railroad Company had any difficulty in resuming their regular fare.

Are not our relations to the public somewhat similar to theirs? Would it not be practicable, as well as profitable, for us to give these good housewives a special, low-priced excursion, through these sweltering hot months, *via* the safe, cool and delightful "*Gas Stove Route.*"

Mr. W. W. Prichard, of Ironton, then followed with his paper, entitled—

IS IT GOOD POLICY FOR GAS COMPANIES TO SELL GAS FOR STOVES, ENGINES, ETC., AT A REDUCED PRICE?

Our experience with gas stoves, engines, etc., has been limited to the past year. Probably most of you have read the article in the AMERICAN GAS LIGHT JOURNAL, issue of Jan. 17th, headed, "Something from Ironton, Ohio," making it hardly necessary for me to go over the same ground. Bringing the comparisons of the monthly consumption by each consumer entitled to the reduction for the reduced price for stoves, etc., up to Jan. 1st, adding the months together, and dividing by number of consumers, I find the result is equivalent to the following: 35 consumers, in 2½ months, increased their consumption 122,400 feet; or a gain of about 1,398 feet each per month. Our stoves are mostly small ones, only three as large as No. 7 A, "Economy," being in use.

As a general thing gas consumers are afraid of gas stoves during the first month or so, or until they find their gas bills did not increase as greatly as they expected. After that they use them more freely. It is a fact that some of the bills presented to our consumers after the first month in which they used gas stoves were actually smaller than those of the previous month, or when no stoves were employed.

One object in offering a reduced price in the attempt to increase our summer and day consumption was to utilize the idle time of both men and retorts, and to equalize the winter and summer consumption, so as not to be obliged to cool down one or two benches every spring, at a loss. Hitherto in summer we often had to keep up the heat of empty retorts during the day. By utilizing such idle time the extra cost to us is but little more than the coal used; consequently there is more profit per thousand, even at the reduced price, than on the regular night consumption. By allowing the consumer the reduced price on all gas passing through the one meter you get about the average profit, and sell more gas.

A reduced price is not only an incentive to a consumer to first try a stove, but afterwards causes him to use gas more freely for other purposes than he did at the regular price. Thus you secure an increase in quantity sold, and a decrease per thousand in ordinary expenses.

The tendency of the times is for cheaper gas. I believe, with the gas stove as a medium, that we can increase the consumption and decrease the cost per thousand sufficiently to put us in position where we can sell gas at a price that will be *popular*.

Newbigging says: "One of the best, perhaps the very best method of reducing the proportion which capital expenditure in gas works bears to revenue, is to cultivate a day consumption of gas, by affording facilities for and encouraging, in every legitimate way, the use of gas for cooking, heating and motive power. This policy, if pursued to a successful issue, is virtually to reduce the percentage of capital in the proportion of such consumption, because the plant is brought to bear in earning profit during the daylight as well as in the lighting hours."

Discussion.

The President—Most of you have had experience with gas stoves and gas engines; and probably all of you have had some experience with special rates. Mr. Welch, of Athens, has been keeping very quite today. We would be glad to hear from him.

Mr. Welch—I hardly think I could give any information that would be of use. Although our works at Athens are very small, we nevertheless endeavor in every way to increase the consumption. We have but few stoves in use—perhaps twenty; but we succeed in placing some new ones each year. We adopted the plan of reducing the selling rate per thousand cubic feet to those who use stoves, not only for gas used in stoves but also for that employed by such users for illuminating purposes. We found it to be good policy to do this, and we expect to continue it. It is the only reduction that we make.

The President—What concessions do you make?

Mr. Welch—Our regular rate is $2.50. We make a reduction to $2 for gas used in stoves.

The President—Do you make the price $2 for all the gas used where the customer employs a gas stove?

Mr. Welch—Yes, sir.

Mr. Bates—I would like to ask either Mr. Prichard or Mr. Converse what plan they pursue in selling gas cheaper for gas stoves. Whether they set a separate meter for measuring the supply to gas stoves?

Mr. Prichard—We allow them a reduction for all gas that passes through one meter.

Mr. Bates—During the whole year, or for the summer months only?

Mr. Prichard—From May first to November first.

Mr. Bates—During the past four years we have had at Tiffin quite an increase in the quantity of gas used in stoves; and, as said, our policy was to establish a special rate during the months mentioned. The gross or ordinary price is $2 per thousand. If a person used 1,000 feet the price was $2; 2,000 feet, $1.75; 3,000 feet and upward, $1.50. On that basis there was quite an increase of consumption.

Mr Gemuender—In December, 1875, Jude Baxter, of the Circuit Court, and also the Supreme Court of Ohio, rendered decisions expressing an emphatic opinion that *quasi*-public corporations could not make any discriminations—in some of the Eastern States they have decided that gas companies were not *quasi*-public corporations; but I should judge, from General Hickenlooper's remarks, and also from the decision of Justice Harlan, that we were *quasi*-public corporations. If such is the fact, no matter whether we consider it the best policy for us as companies to pursue, then we have no right to make discriminative rates.

Mr. Huntington—In our early Columbus experience, or when we were selling gas at $1.75, we made some concessions to large consumers; for instance, we furnished gas to hotels at $1.65. However, when we reduced the price to $1.25, several years ago, we considered that a sufficient concession to all consumers, and the rate was made uniform to all. My own observation at the time was that the difference in price made a great deal of trouble. If one large consumer had a concession, some other man, who burned nearly as much, wanted a similar concession also, and it was very difficult to establish a line which would give satisfaction. A uniform price, although it does not give perfect satisfaction to all parties perhaps, makes less trouble, in our experience, than the varying schedule did. We now have a good many gas stoves in use in our city. I cannot state the exact number; but I think it is about 1,500. For about seven years every pound of food consumed in my own house has been cooked on a gas stove. Neither myself, my wife, nor my cook would go back to a coal cooking stove so long as we can get a gas stove. We all like it. It is clean, it is always ready, there is no trouble in its manipulation; and a servant can manage it as well as any coal stove. I believe there is no saving to the consumer, in dollars and cents, with ordinary soft coal at $1.85; but it is a much handier and pleasanter implement in the house than a coal stove. I strongly recommend the use of gas stoves to those who can employ them. I believe the gas cooking stove to be a good domestic institution for both summer and winter use.

Mr. Converse—I would like to ask Mr. Huntington if he knows how many cubic feet of gas per month he uses in that stove.

Mr. Huntington—I cannot give the figures; but possibly Mr. Gemuender can.

Mr. Gemuender—I cannot tell, for I do not know what quantity is used by the stove and what for light.

The President—I would call your attention to a decision recently made by Judge Dennis, of Baltimore, Md., who affirms that the Consolidated Company of Baltimore might legally charge $1 per thousand in one portion of that city while the selling rate in other sections was but 50 cents. He bases his judgment on the fact that if $1 is not an excessive price no injustice is done to those paying such rate although others may be obtaining the same service at a much lower charge.

Mr. Gemuender—I concede you have a right to discriminate, provided you do not charge one man more than another for the same service—that is to say, 15 cents off the price for one customer, and 8 or 10 cents for another. The latter is what I understand by discrimination. It may be all right to charge 50 cents in one part of the town, and $1 in another.

Mr. Padan—We introduced a few gas stoves in Portsmouth at a reduced rate—$1.50; but I have always thought such practice leads to trouble. I do not think the principle is equitable. In some places the use of gas for stoves is made a plea for the reduction. For instance, Mr. Converse charges a consumer who uses a stove at the rate of $1.50 per thousand. The stove takes up, say, 1,000 feet per month, and if the same party uses another thousand feet for light, his total expense for gas is $3 per month; but the occupant of a store next to the premises of the stove user burns 5,000 cubic feet per month for illuminating purposes, and has to pay $10—the case at Portsmouth is similar. Naturally the storekeeper asks, "Why the discrimination?" We answer the complaint by saying that the man to whom the concession is granted uses a stove. I think the practice will finally bring vexation. I do not think it is a good plea, although we are practicing it, and I do not know how it will terminate.

Mr. Tayler—Some years ago (we then charged $2.50) we made an effort at Warren to induce the use of gas stoves by agreeing to supply gas to them for $2 per thousand. In attempting to formulate a plan of how best to do it I was somewhat puzzled. I did not want to put in an extra meter, and did not want to furnish the consumers who took gas stoves with gas for illuminating purposes at the reduced figure. I was afraid that a merchant who used as much or more gas in his store might complain; or that, in order to get his gas at $2, he might buy a small gas stove, place it in his store, and then claim to be entitled to $2 gas. I finally concluded to estimate with the consumers as to the proportion of gas used in stoves, and that used for light; but if we could not agree on the estimate, I would put in a separate meter. We ran along very well on that plan, and increased our consumption by placing quite a number of stoves. From that time on I have worked hard to bring the price of gas down to stove rates for all purposes, and have succeeded in lessening the gap between them. I have made up my mind that our discrimination is a wrong policy, because I fail to see why it does not favor a few at the expense of others. In reality it seems to favor those who are not large consumers. Very often those who had stoves expressed the opinion that nearly all the gas used in the month had been taken up by the stoves, but my idea was quite to the contrary—it had been used mostly for lighting. Lately we have been charging $2 per thousand for gas to stoves, and a similar rate to those who use 5,000 cubic feet or over per month for any and all purposes, $2.50 being charged to ordinary lighting users; but I hope, within 30 days, to make the bills out at $1.80 net to everybody. (Applause.) And, by-the-way, the city during the last six years has paid the same rate for gas as other consumers. Even in the case of gas supplied to the public authorities, I am of opinion that it would be the best policy to oblige them to pay the same rate as the private citizens. I admit the cities grant us all the rights and privileges we enjoy, and that their claim for cheaper gas is paramount to that of any other consumer; nevertheless, for the benefit of consumers of gas as a whole, it is to their interest, as taxpayers and as gas consumers, to have but one price. I think if we can adhere to that rule it will hasten the day of low-priced gas.

The President—I am inclined to believe that Delaware county is not "solid" in the opinion that the "two-prices rule" is a good one, and we would like to hear from Judge Jones in the matter.

Judge Jones—I am against discrimination, not only in regard to gas rates but in all other instances as well—by railroads, banks, etc. I am inclined to think that no other phase in the present aspect of our affairs in this country looks so dangerous and so ominous to our continued prosperity as a people than this very matter of discriminations, especially so in the matter of discriminations to large operators and large consumers. One man, for example, has a couple of carloads of steers that he wants to ship to New York; but another man who ships larger lots from the same point to reach a like destination obtains such a rebate (it amounts to a profit) that the smaller operator cannot compete with his more fortunate competitor. It goes through all the business of the farmer, likewise through all mechanical businesses, and to so great an extent that the small operators throughout the country are being worn out and driven from the field by the larger ones. You can scarcely find now one of the small wagon building shops that formerly abounded in this country; the big shops have destroyed the smaller fry. This centralization of interests destroys that distribution of products and the location of producers so essential to the independence and prosperity of the country. But to come to our own business. Suppose we make a concession to our large consumers; who really gets the benefit of that act? The saloon and billiard hall keepers, railroad offices, etc., the very parties who can and ought to pay liberally. The man whose gas bill for the month is only $1.50 has much harder work to pay it than is the case with the party whose bill is $70 or $80 per month; and further, as a rule, the latter may add the price of his gas bill to the goods which he sells, and thus recoup himself. I claim that the question of right and wrong precludes such discriminations; and I ask you to distinguish between right and wrong in the gas business. You may remember that not long ago a question propounded at a meeting of one of the gas associations asked whether we ought to be governed by what was right and just, as between man and man. Now, I claim it is wrong to say to the saloon keeper, or to the hotel keeper, or to any other man who uses a large amount of gas, that he shall have his supply for $1 per thousand; and in the next breath say to the working man that he must pay $2 per thousand for a like commodity. There is neither right nor justice in such a proceeding. And again, I do not think you can follow out the plan legally. In fact it is out of the question to do it legally. When the people thoroughly awake to the true aspect and significance of these things I fail to know of any argument that can be used by them against a gas company that will tell with greater force against our business. Look at the reputation enjoyed by men of the railroad-swallowing stamp—Jay Gould, for instance. How does he stand in the eyes of the public? Students of political economy and shrewd observers of the drift of social conditions, assert that these practices which tend to centralize business in the hands of a few, comparatively speaking, are pregnant with greater danger to the continued healthy existence of our institutions than that coming from the presence of the nihilists or any other sort of imported ruffians in our midst. The injustice of the practice would appeal to and stir up the passions of our own law-abiding and order-loving citizens. These would be justly indignant over a plan that worked for their oppression. If we make discriminations in gas rates the people learn to expect them in other directions. A party in the town of Delaware (he has branches in other towns) gets his gas at a reduced rate because his monthly gas accounts are something like $100 each; probably that man, on the strength of the Delaware treatment, insists upon the same concession in other localities. It is building that fellow up, but it is keeping his smaller competitors down. He has an advantage over them. You may remember that we at Delaware led off in the movement for low gas prices. I think at the time we reduced to $2.50 no other company in the State of Ohio sold at as low a rate. We previously had made a concession to one of our hotel keepers (when the rate was $3 he paid only $2.50), and when we reduced the price to all to $2.50 he said, "Now you should let me have gas for $2." We considered the matter well, and concluded finally to make an even $2 rate to everybody; but then the landlord said, "You have played smash. There is no sense at all in this move. That price is altogether too low. You should charge me $2, and charge all other people $2.50." He did not burn 100 feet additional per month at $2 than he did at $2.50. I really think if we had kept it up on the others he would have burned more, for he would have been delighted at the idea of being more important than his neighbors. We cannot, however, afford to tickle the vanity of such fellows. Our gas business must be so conducted that we can invite and be willing to have the light of day turned in upon it—upon our books, or upon just what we are doing; and it will not do for a gas company to transact its business in any other style. I do not think any Ohioan whose capital is invested in this business would be opposed to that. I think, as a general thing, the gas business is conducted on the highest principles of honor and business integrity. Our Legislature has passed an act undertaking to determine what we shall charge, and that act has been determined to be legal. They may enact that we shall charge not to exceed so much; and they may also enact that we shall not discriminate—there is no question about it. In point of common law Mr. Gemuender was undoubtedly right in saying that it would be illegal to discriminate. In the Granger suits decided by the Supreme Court of the United States, it was decided that the Legis-

lature might determine how much a railroad should charge; and we now have an Ohio statute in reference to the charges of gas companies. In view of all this it would seem if we were to indulge in this policy of discriminating to such an extent that people would get to understand that we were discriminating, they would appeal to the courts, or to the Legislature for redress. I do not know what sort of lawyer the man is who contended that gas corporations were not *quasi*-public corporations. They have always been so treated and so regarded in Ohio; as matter of fact, we are dependent upon the voters of the municipalities in which we live in reference to the prices we shall charge, and as to how our business shall be regulated. Suppose it should become known that, say in small towns like ours, half a dozen saloon and billiard hall keepers, railroad offices, etc., paid but $1.50 for gas while the masses of the people were compelled to pay $2. What do you think would be the consequence at the next election? What would they say (I mean those who reason fairly without any reference to the demagogues) about that policy? They will say, I think, "You had the privilege of digging up our streets and laying your pipes; we gave you a franchise, with its privileges, and now you seek to discriminate between our citizens." I say, therefore, that discrimination in prices charged for gas, used for the *same purpose*, is unjust. Now, in reference to gas sold for mechanical and domestic purposes. Even if a general lower rate is charged therefor than that used in lighting, there is no discrimination. All are treated alike. I am inclined to think favorably of that policy, and we have been considering whether we should not insitute it at Delaware. For instance, a local printing office in our town uses a gas engine—one other engine is employed by another party, and quite a number of cooking stoves have been put in, as Mr. Converse stated in his paper. I further believe that when gas rates reach the lowest possible point only one general rate for all purposes shall prevail. Take Columbus, for instance. I fail to see how any concessions could be granted there. I do not see how they managed to get the $1.25 rate at Columbus; but I suppose it must be owing to the extraordinary talent shown in the management of the Columbus Company's affairs. I suppose we can make a somewhat lower rate at Delaware than the $2 one, and I think it very likely that we shall do so in the near future. I agree with Mr. Converse in his statement that if anybody more than another is to be encouraged it is the house-wife who does her own cooking; and I would help her by popularizing the use of gas for domestic purposes.

Mr. Fette—When I was invited to say something this morning, I replied I had not come to speak but to listen. I have listened to what has been said on this subject with a great deal of pleasure; and I wish to affirm that I am in favor of these discriminations, although not sure as to their legality. As Judge Jones put it, I suppose discrimination cannot be legal. I cannot see, though, why people who buy goods at wholesale are not entitled to lower prices than those who buy goods at retail. This rule is adopted in every other kind of business. We all expect to pay more at retail than at wholesale. That is one argument in favor of discriminating to the advantage of the large consumer. Another argument is that it costs less to supply that large consumer than it does to supply the same amount of gas to a large number. In the case of one company that I have in mind a single consumer burns 1¼ millions cubic feet of gas in the year. He has but two meters. If that same amount of gas was burned by the average consumer of the same place about 250 meters would be required in the measurement. Each of those meters would represent an investment of $7 or $8, one or two additional men to take statements, 250 separate bills, with the extra trouble of their collection, etc., whereas the single customer requires but two meters, no trouble to read the statements, and so on in contrast with the 250. The same gas company to which I allude did have as a consumer another manufacturing company right alongside of the gas works—just as that hall is alongside of this room. We could run a pipe into that mill and supply it with gas much cheaper than in the case of the supply to the party who burns the 1¼ millions cubic feet per year, because we would save 15 or 20 per cent. of leakage—the building or establishment of the latter is three miles distant from the gas works. Prior to my connection with the gas company, its owners had the misfortune to lose as a consumer the mill alongside of the gas works, because the price was maintained at the same rate as that charged to other consumers. That mill used one-quarter of the whole amount of gas sold by the company at the time. I can name no price to that manufacturer which will induce him to take our gas again, for he put up his own works. I think these two illustrations are pretty strong arguments in favor of discriminations.

Mr. Gemuender—Mr. Fette remarked that wholesale dealers sell at lower rates than retail dealers; that they would sell at a lower rate to a wholesale customer than they would to a retail one. Does the wholesale dealer make a larger margin of profit than the retailer?

Mr. Fette—That I cannot say.

Mr. Gemuender—I do not think so. If it were so no man would start a retail grocery. I think that the interest on the capital invested is exactly the same in both cases.

Judge Jones—If I may say another word, in answer to the the remark of Mr. Fette about the large consumers. I think the important question for us to consider is whether those few wholesale or large consumers are of as much importance after all to our companies as the mass of small consumers. I claim they are not; they do not begin to be; and we cannot afford to sacrifice the interests of the mass to the interest of the few, merely because it would seem to be an advantage in our favor when we consider the cost of supplying them as compared with the cost of supplying the large consumers. We should never forget that we are dependent upon the mass of the people, who are each contributing a little for our support, and that we cannot afford to do a thing which seems to be unjust to them simply because of the respective money aggregate of their dealings with us.

Mr. Prichard—I think it is a question as to who is making the discrimination. If we can, through utilizing idle labor and plant, cheapen our cost of manufacture in the sum of 40 cents per thousand, simply through working in the daytime, I think we ought to grant those who use gas in the daytime a concession for the good they have done us.

Mr. Ross—I have a case in mind, that happened in Kenton, which bears on this question. We had discriminated heretofore by charging $2 for gas used in domestic and mechanical purposes, while lighting consumers who used less than 2,000 cubic feet per month were charged $2.50. On January 1st we made the price $2 to all, and find that our people are very much better satisfied. There is less complaint. I had one customer—a barber—who used 2,000 feet in one month, and paid $4 therefor; but his near neighbor—another barber—who used only 1,900 feet, paid me $4.75.

Mr. Converse—I somehow had the impression that we ran our gas works to make money, and I fail to see where we are doing any injustice by selling this gas in the summer time at a lower rate. As Mr. Prichard said we can make this gas for day consumption at a really decreased cost. In Delaware most of the gas stoves are used by people in moderate circumstances, or in situations where the housewives do their own kitchen work, hence it seems to me, if we wish to benefit people in moderate circumstances, we can do so directly in that way. They use very little gas for illuminating purposes. In the winter time their gas bills are from nothing to 20 cents each month. They cannot use gas generally at our rate of $2 per thousand. A gas stove will take up from 2,500 to 3,000 feet per month, and I question very much whether 3,000 feet is not a little short of the mark. Of course, if it is illegal to discriminate after our fashion at Delaware, that ends it; but if the contrary is the case, a profitable field is open for us.

Mr. Ross—We find that our stove consumers have been benefited by equal prices. They are getting fuel for less than they got it before from any other source. We have 28 or 30 stove customers who use gas for cooking in the summer, and for heating purposes in winter, and the average charge is about $1.60 per month. In not a single case has the consumption on stove account reached 2,000 cubic feet per month.

Mr. Converse—Your consumers cannot use a gas stove when washing or ironing; and it would seem that they do but mighty little cooking. At $2 per thousand your average would equal 800 feet. We have followed the gas stove business pretty closely—in 1884 about 244 stoves were in use—have personally shown our consumers how to use the stoves, and called in occasionally to inspect them, but I fail to remember an instance where a person was able to do much cooking—not to mention anything about washing and ironing—on a consumption of gas considerably above 800 cubic feet per month.

Mr. Bates—My experience shows that where the ordinary consumer, for lighting purposes in the summer, burns 800 feet, his bill will increase to 3,000 or 4,000 feet when he obtains special rates for cooking purposes. This shows that the average users of gas stoves do thereon their cooking, and more or less ironing, perhaps not all of the latter, but the uses to which they put them will increase the consumption 2,500 or 3,000 feet. I think it pays to give low rates. I think we have just as much right to do so as any wholesale dealer. Any man who will charge 25 cents per pound for coffee at retail will let you have it at 23 cents if you buy by the hundred pounds. I think we have the right to sell our gas in the same way.

Mr. Ross—Some of our best citizens are cooking in the summer time with gas fuel. I cannot say about washing and ironing. I think that our people who use gas stoves for cooking usually have their washing and ironing done away from home. So far as cooking is concerned, I can only say to you what they tell me. I ask them if they do all their cook

ing with gas, and the usual reply is, "Yes." Some few of them say they burn it in the grate at times. I find that their gas bills are not as much in summer time, for all purposes, as they have been in winter time for light alone. I have averaged the bills of a number of families who use cooking stoves in the summer, and the figures show $1.60.

Mr. Padan—My objection to the plan suggested in the papers is not that I am opposed to discriminating in favor of large users, but because I object to discriminating in favor of small dealers, as this gas stove business seems to do. We have had people who purchased small gas stoves, using them occasionally for heating, never cooking anything with them, just to get the lower rate. I do not object to discriminating in favor of large dealers. What is the use of objecting to the plan? We *will* do it; and that is the end of it.

Mr. Christian—I think a good way to get over this difficulty is to do as I have done in two cases. When a party asked me what gas would cost for cooking I asked how large a stove he desired to use—a two, three, or four burner. Having answered as to the size, I tell him what it would cost to supply gas to it. I do not put in a separate meter, but charge him in accordance with the specified agreement. In that way I think we get a good figure for our gas, and are not discriminating.

Mr. Padan—Do many of them do washing and ironing with the gas?

Mr. Christian—They all do washing and ironing with it when you give them the gas in that way.

Mr. Converse—I think it is pretty evident Mr. Ross has not made a success in the stove business if his people get along with so small a quantity of gas, and if such use is confined to the wealthier class of people. Our experience is right the other way. I know that every gas manager, particularly those in small works like ours, takes pride in seeing how much he can increase his output each year; and I think day manufacture and day send-out is the point we all should strive to develop.

Mr. Thompson—I would like to ask Messrs. Converse and Bates about the size of these families who use three or four thousand feet of gas per month to cook with. I think they must have numerous and healthy appetites for breakfast, dinner and supper, with zest for sundry hot lunches between. Three thousand feet of gas for cooking purposes, in an ordinary family, in the towns in which our friends are located, looks like an enormous quantity. I have been using a gas stove for four or five years, and although my family is small, our entire work is done on it. Averaging it through the summer and winter, we use 1,000 cubic feet per month.

Mr. Converse—Do you bake on your stove?

Mr. Thompson—Yes.

Mr. Converse—Washing and ironing also?

Mr. Thompson—No; everything except that.

Mr. Gwynne—In Fostoria we have about 45 stoves out, and the average monthly consumption of each is from 1,500 to 2,000 cubic feet. The price charged for gas for cooking is $1.50 per thousand, which is a special rate lasting from April 1st to Oct. 1st. Last year these 45 stoves brought us in about $1,000, which is almost a clear gain, less the actual cost of the coal and purifying material used, for the retorts would otherwise have stood idle during the daytime. As to the sliding scale charged for illuminating gas our gross price is $2.50 per thousand, with discounts ranging from 5 to 15 per cent., in accordance with the quantities used each month. We find those rates work very nicely. We have had very little "kicking" over them. I do not think others will have any more trouble than we have had if they will only take pains to explain the situation to their customers.

Mr. Bates—According to my experience storekeepers will pay $2 per thousand for gas used at their stores, and $1.50 for gas consumed at their houses for cooking and lighting, and make no comment. They are at least receiving the benefit of the plan in their household arrangements, and are perfectly satisfied to pay the two rates. I think one reason why the consumption of gas in a stove increases after the first month or so of its use lies in the fact that the housekeepers become a trifle negligent and do not shut the burners off at the moment they ought. People have said to me they put gas stoves into their stores for the purpose of getting the cheaper rate. I told them we were selling gas to make money; that if we sold at a special rate for cooking purposes it was because we could run the gas works in the daytime and utilize the works; that if we could sell it to them cheaper for the purpose it was because we were able to make it cheaper. When they suggested putting stoves in their stores so as to get the lower rate I told them that it would not do, for the question was not whether a man had a stove but whether he used it. At Tiffin the result has been very favorable. For the first two months from the time the people used stoves we had a good deal of dispute. We ended the grumbling by saying that we were running the thing to make money, and fixed our rates, and proposed to do thus and so.

On motion of Mr. Butterworth, a vote of thanks was tendered to Messrs. Converse and Prichard.

(To be continued.)

The Proposed Massachusetts Law to Regulate the Supply of Electric Light by Gas Companies.

The following is the text of the Hartwell bill to allow Massachusetts gas companies to engage in the business of electric light supply:

SECTION 1. The Board of Gas Commissioners, upon application in writing by any company organized or chartered under the laws of the Commonwealth for the purpose of making and selling gas for illuminating purposes, may, after such notice and hearing as said Board shall deem proper, authorize said company to engage in the business of generating and furnishing electricity for light and power in all or such part of the territory in which it is authorized to supply gas as said Board may designate; provided, however, that said company shall not engage in said business so authorized unless by a vote of two-thirds of the stockholders, representing not less than two-thirds of the stock, at a meeting duly called for that purpose. Said company so authorized shall file in the office of the Secretary of the Commonwealth a certificate as provided in section 51 of chapter 106 of the Public Statutes.

SEC. 2. Said Board shall at the time of granting said authority prescribe the time, not exceeding eighteen months, within which said company shall erect and equip such a plant for generating electricity for light and power as may be required in the specified territory, and designate the minimum capacity of such plant; and if said company shall neglect to erect and complete said plant within the time prescribed, said authority shall thereupon become void, and no such authority shall be again granted to said company within two years thereafter; provided, however, that said Board may for cause shown extend the time first prescribed for erecting and equipping said plant not more than six months from the expiration of the time first prescribed.

SEC. 3. At the expiration of the time and extension thereof, if any, given under the preceding section said Board shall, after such examination as they shall deem proper, make, in a book kept for that purpose, a record as to whether their orders with reference to the erection and completion of said plant have been complied with. Said record shall be conclusive evidence of the truth of the matters stated therein, except in cases of the purchase or lease of the property, licenses, rights and franchises of some electric light company, as authorized under section 9 of this act.

SEC. 4. Said company shall not erect or maintain any poles for the support of wires, nor erect or maintain any wires in, through, or over any streets or highways, nor dig up any streets or highways for the purpose of laying said wires underground, until it has (upon petition in writing by said company) first obtained the consent in writing of the Mayor and Aldermen of cities or Selectmen of towns in which said streets are located.

Said company having obtained such consent, may, under the direction and control of the Mayor and Aldermen or Selectmen, dig up and open the grounds in any streets and highways, so far as is necessary, for the purpose of laying lines of wires to carry into effect the authority given under this act, and for the purpose of keeping said lines in repair, and to erect and maintain lines of wire upon or above the surface of such streets and highways.

The said company shall put all streets and highways which are opened into as good repair as they were in when opened, and after failure so to do within a reasonable time shall be deemed guilty of a nuisance.

SEC. 5. When a party, injured in his person or property by a defect in a street or highway caused by the operations of said company in laying down, erecting, maintaining or repairing its lines of wires, or otherwise obstructing such streets or highways, recovers damages therefor of the city or town wherein such injury is received, such city or town shall, in addition to the damages so recovered against it, be entitled to recover all the taxable costs of the plaintiff and defendant in the same action in a suit brought against said company, if said company be liable for said damages, and if reasonable notice is given by such city or town to it, so that it may defend the original action.

SEC. 6. The Mayor and Aldermen of cities and the Selectmen of towns, respectively, may regulate, restrict and control all acts and doings of said company which may in any manner affect the health, safety, convenience or property of the inhabitants of their respective cities or towns.

SEC. 7. Gas companies, as respecting the business in which by this act they are authorized to engage, shall be subject to the control of the Board of Gas Commissioners in the same manner and to the same extent they now are or hereafter may be respecting the business of furnishing gas.

SEC. 8. Except as hereinbefore expressly provided, gas companies shall (in exercising the powers conferred by this act) have all the powers and privileges and be subject to all the duties, restrictions and liabilities set forth in all general laws which are now or hereafter may be in force

relating to companies engaged in the transmission of electricity for light or power.

SEC. 9. Said gas companies so authorized shall have the right to purchase or to lease and to use all or any of the property, licenses, rights, privileges and franchises of any electric light company engaged in the business of furnishing electric light or power in the territory in which such gas company may be authorized to furnish such light.

SEC. 10. This act shall take effect on its passage.

Otto Gas Engine and Lightfoot Refrigerator.

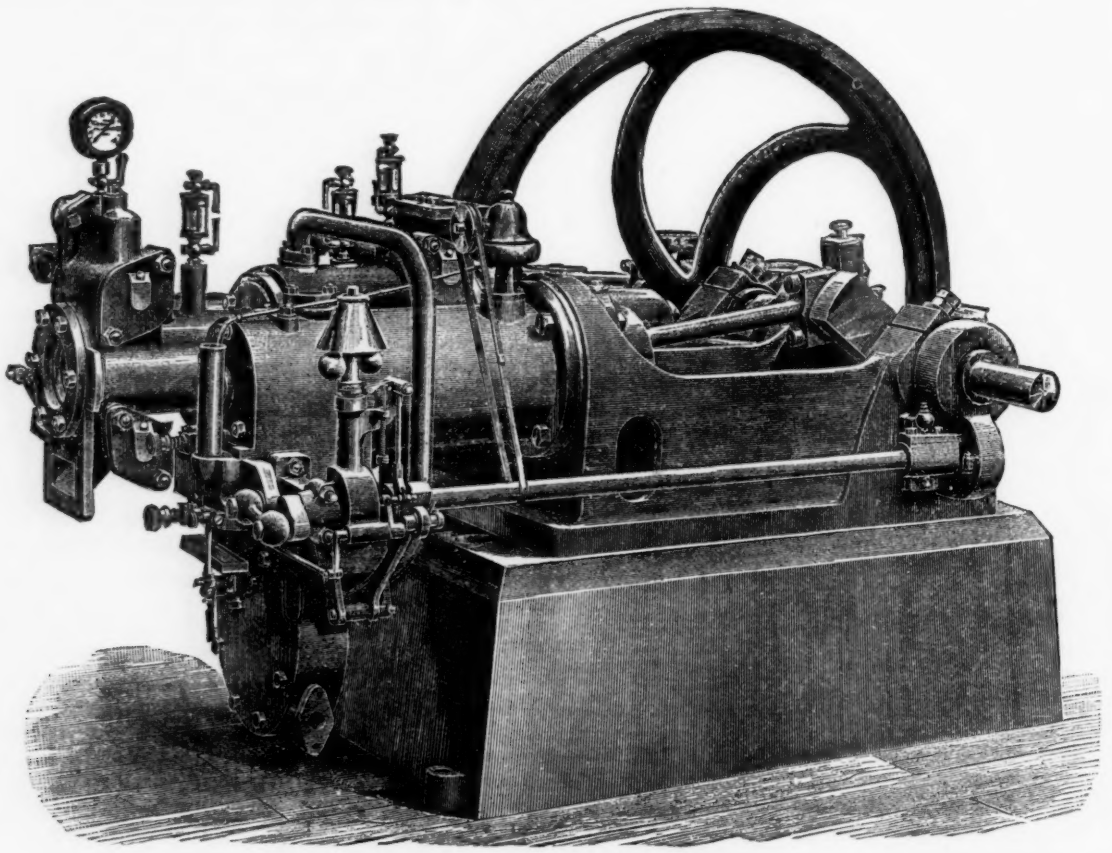
The Engineer, London, England, calls attention to the following example of the effectiveness of the above-named combination in carrying on the special duties described. Our authority says:

To meet a want that has long been felt by butchers, poulterers, fishmongers, chocolate makers, and others for a cheap, simple, and efficient means of cooling, Messrs. Crossley Bros., Manchester, have recently brought out the machine which we illustrate above. It consists of one of their latest type of Otto gas engines, combined with a Lightfoot's patent dry air refrigerator of similar construction to that which obtained the gold medal at the International Health Exhibition. The air cylinders are combined in the usual way, and are placed alongside the gas cylinder, the two sets being bolted up to a neat frame. The air cooler with drying apparatus is in the pedestal below, the arrangement being such that the water passes first through the cooler, then through the jacket of the compressor, and finally through the jacket of the gas cylinder; water vessels are therefore dispensed with. In the refrigerator, as well as in the gas engine, the simplest and most straightforward design has been followed, in order not only to reduce first cost, but to enable every part to be readily accessible and easily kept in order. The air valves are of the Corliss pattern, with positive action, allowing the apparatus to run at a high speed with economy and efficiency. It has been found after several years of experience that these valves last well and require no attention beyond lubrication—matters of great importance, when, as is frequently the case with gas-driven engines, the plant is left to itself during the greater part of the day, and is only occasionally looked after by an unskilled attendant.

The machines are made in several sizes, to deliver from 2,000 to 6,000 cubic feet of dry cold air per hour, but smaller and larger combinations can be made if required. The gas engine can be disconnected from the refrigerator, so as to be applied to other purposes when cooling power is not required.

We may mention that a gas-driven refrigerator on Lightfoot's system has been in constant operation for about two years in the vaults of Messrs. J. S. Fitter & Sons, Leadenhall Market, where it has given the greatest satisfaction. There are four chambers capable of together holding some twenty tons of meat. It has been found that about six hours working per day suffices, and there is no difficulty in maintaining a temperature below freezing during the night, and from Saturday to Monday, without running the machine after ordinary hours. In winter the water, after performing its cooling duties in the refrigerator and gas engine, is used for heating the offices. During the two years this machine has been at work no repairs have been required beyond the occasional setting up of the brasses.

The principal advantages of such a combination as we have described are—economy in first cost and in space occupied, cleanliness, convenience, and saving in attendance, as no skilled labor is required. The machine is practically noiseless in action, and is readily started and stopped at a moment's notice. We need hardly add that it is of great importance that machines of this kind should run without risk of breaking down, and in this respect the Lightfoot refrigerator has proved most satisfactory.



Combined Gas Engine and Refrigerator.

How to Select Cast Iron Pipe.

[Mr. Geo. W. Pearsons contributed the following rules in the above regard at the last meeting of the American Water Works Association. Perhaps Brother Decker, of the Hannibal (Mo.) Gas Light Company, could be prevailed upon to give his views on Mr. Pearson's conclusions. Certainly, the Hannibal gas man is thoroughly conversant with the subject.—ED.]

Uneven Castings.—In past discussions the fact of pipe being sometimes thinner on one side than on the other has been passed over as a rare, and probably not very serious fault. My experience in laying some 130 miles of cast iron pipe, and its test by direct pressure, leads me to consider it one of the most common and serious faults we have to contend with—a large majority of the broken pipes that I have seen developed this inequality. I speak of pipe broken in the ground by pressure.

Quite frequently I have found such pipe broken, with an irregular angular fracture, always on the thin side. The fracture, instead of being radial, being diagonal to the surface and resembling a rough tear. I have never seen such a fracture made by breaking a pipe in any other manner, and think it must be due to unequal contraction in cooling, caused by the unequal thickness.

Such a pipe is dangerous whether it has passed the test or not—all such pipes which I have seen broken have been tested to 300 pounds, according to the statements of the manufacturers—and, notwithstanding they showed

no fault on careful inspection before laying, have generally given way before the pressure reached 100 in the ground.

Pipe can be tested for unequal thickness by being rolled slowly over level skids by a single operator—any pipe which shows a disposition to get away should be allowed, in fact be aided in the tendency. The best place to do this is in the pipe factory before the pipe has gone into the tar bath, and I think if the importance of this were realized by the makers it would be done.

I know as regards water test that all I have seen has been apparently done with proper care; but do we, or even the manufacturers, know that their workmen are always faithful in this if they are not well watched.

Pipe Weight.—My experience fully justifies the use of as light pipe as indicated by the discussion.

Lead Room.—How can a reasonable uniformity of lead room be maintained? I have had a gang of thirty men up all night chipping the spigot end of two specials to get them into the bowls into which they were to fit—all standard weight pipe from the same factory; and from the same factory have laid pipe in which the lead room was from five-eighths of an inch to over one inch.

Remedy.—Call for standard outside sizes of pipes, and require all manufacturers to conform to these sizes, leaving the inner diameter to be governed by the thickness of the pipe. Most of you lay pipes from different factories, and I presume, like myself, have suffered from the difference of sizes.

Yarn and Lead.—The yarn should fill to the lead score; the bead on the pipes takes, with some irregularity in alignment, perhaps one inch; yarn, one inch; lead, one and one-half inches; three and one-half inches, say three inches in small pipe, and four inches large is deep enough for the bowl.

How to Get Good Pipe.—Buy it by the lineal foot instead of by the ton; specify, if you desire the minimum thickness to be used, and the water test required; then the manufacturers will take pains to keep out overweight, and will be enabled to make skill in manufacture a paying item in their works. As it is now, the superiority of one maker over another in this particular has no market value. Buy specials by the piece.

Incandescent Lights on High Tension Circuits.

At the Philadelphia meeting (Feb., 1887), Mr. Jos. Wetzler read the following paper. Our report of same is from *The Electrician:*

The demand which the public makes for electric lighting must be satisfied, and although the arc satisfies it to a considerable extent, experience has shown that the incandescent light is in equal demand and that arc light stations are called upon to furnish it. The service is found to be equally as profitable as arc lighting; and hence the introduction, by way of necessity, of incandescent lamps on arc circuits has become quite general.

The object aimed at is to reduce the quantity of copper required for the distribution of the current to incandescent lamps. This is accomplished by increasing the electro-motive force employed on the circuit, and reducing correspondingly the total current required.

It is proposed in this paper to give a resume of the various ways in which this may be carried out, so that those interested in electric lighting may become acquainted with what has already been done and suggested. It will be necessary at the outset to state that it would be injudicious to assume that any one system is given as a perfect solution of the problem, for the conditions of service vary so much in each case that where one system would be a success, another might prove a failure. In other words, we must look at the question in a broad light and consider that all of these systems have their field of application, which depends alone on local circumstances.

Very early in the history of electric lighting Mr. Edward Weston proposed the placing of incandescent lamps in multiple series, by means of which they could be connected to a high potential dynamo. He was followed by others who adopted the plan of inserting the incandescent lamps in arc circuits. The usual method of doing this, as you all know, consists in employing a "distributor," which, generally speaking, is a device for connecting incandescent lamps in multiple series on an arc circuit, and which contains mechanism for preventing an increase of current when a lamp breaks. These devices, of which there are several forms in use, among them those of Brush, Slattery, Little-McDonald, etc., need not be more particularly described here, as they are already known to all of you. They are of undoubted value, but they cannot be said wholly to satisfy the general wish of electric light men for maintaining incandescent lamps on high-tension circuits.

The question then arose, How can the field of incandescent lighting be broadened so that the benefits of small-wire circuits can be taken advantage of, and so that the electric light can in the fullest sense take the place of gas as an illuminating agent?

This question can be answered in a variety of ways, each of which may be correct. I will take up the discussion by presenting the most simple case, and that is, the running of incandescent lamps in plain series, similar to the disposition of arc lamps. This has been successfully accomplished in one way, in what is known as the Edison municipal system. If we examine into the condition under which this system can be operated, it appears that we have here a field which is well worth looking into, and as it has not, to my knowledge, been brought prominently forward, I propose to give a few details of what can be accomplished by it. One of the main objects for which this system was devised is the displacing of the street gas lamps. As such it evidently comprises in itself the use of very long circuits, and their economical operation is a first consideration. The dynamos employed for this service have an E. M. F. of 1,200 volts, which allows for any drop in potential that may be desirable up to 17 per cent. in the wire, while a pressure of 1,000 volts is left to be expended in the lamps. The largest type of dynamo constructed for this system can feed 12 distinct circuits, upon each of which about 65 lamps of 15 c. p. can be placed, or 800 lamps in all. Each of these circuits carries a current of only 4 amperes, so that only a very small wire is required to convey the current, a number being generally employed.

With twelve circuits at our disposal from a single dynamo, it is evident that a wide range of distribution is possible, and the small cost of conductors is a decided advantage. Then again, the system permits of placing lamps of greatly varying candle-power anywhere in the same circuit, ranging as high as 50 c. p. Thus each circuit is capable of feeding lamps aggregating 1,000 c. p., whatever be the illumination of the individual lamps employed. This gives a basis of calculation upon which definite results can be quickly predicated. The system, such as it has been outlined here, is in operation in various cities, among them Portland, Me., where 500 lamps are so connected; Lawrence, Mass., with 550, and Denver, Col., with 530. While it is principally designed for street lighting, the system is also adapted to interior lighting where the load is a constant one, as in stores which remain lighted up to a fixed hour in the evening.

A system similar to the one described has recently been put in operation by Mr. Chas. Heisler, in St. Louis, and also in Vincennes, Ind.

A recent interesting modification of the method of running incandescent lamps in series has been brought out by Mr. Alex. Bernstein in England. His method consists in utilizing the full arc current of about 10 amperes as ordinarily employed and running incandescent lamps of low resistance, which require only six volts E. M. F. Thus with an arc dynamo developing 2,000 volts, over 360 lamps could be placed in series. Several installations on this plan have recently started in England, and with reported good success.

A still more recent method of similar design is that of Prof. Elihu Thomson. This also consists in doing away with distributors and placing incandescent lamps directly in series in the same circuit with arc lamps. These lamps take the full current, and lamps of different candle-power can be inserted in the same circuit. In all these systems, provision must evidently be made, and now is, for preventing the interruption of a circuit when a lamp is extinguished.

There are still other methods of intercalating incandescents on high potential circuits. One of these is by means of induction through what are called secondary generators. As I understand that another member has prepared a paper dealing with this highly important branch I shall leave it with this mere mention and draw your attention to a second method by which induction can be utilized for running incandescent lamps directly on arc circuits. This is the method devised by Mr. Ph. Diehl, which has lately been made public. The incandescent lamps in this system are arranged in two branches, between arc lamps, and a current interrupter is so arranged that the current is alternately broken in one set of lamps and simultaneously sent through the primaries of the other lamps. Thus the main current remains continuous and unbroken, while the rapid interruptions in the incandescent branches induce the current required to bring the filaments to incandescence. Lamps of any desired candle-power can thus be easily inserted in the circuit.

This outline of the principal systems will give electric light men some idea of the various methods by which the incandescent light can be brought into service without the necessity of employing large conductors.

Thus far, I have only alluded to methods where the connection between dynamo and lamp is a direct one, but there are still other methods which come under the title of this paper, but which have hardly yet forced themselves upon the attention of those present. I refer to the use of storage batteries as an adjunct to an electric light station. You will probably all remember that when the storage battery was first brought out prominently, it was said that each house could now be provided with its quota of batteries, which, being charged from a central station during the day time, could furnish current for the lamps in the hours of darkness. During the past few years, while the storage battery has been in a state of slow evolution, this idea has almost fallen into oblivion; but I think the time has arrived when the problem should again be attacked in earnest and be brought to a practical solution. The reliability of the storage battery is now beyond

cavil, and it only remains to work out the details. Let us glance for a moment at the method employed here, and see what it involves. In the first place, your arc light dynamos, which now lie idle on an average sixteen hours out of the twenty-four, could be run practically during the whole twenty-four hours, charging the batteries in the circuit in the houses during the day time and doing their regular lighting as usual at night. Thus no additional machinery or boilers will be required. Considering the installation in each house, all that would be required would be a battery of accumulators which, for economy of current, should have an E. M. F. of about 60 volts. This would be reached by 30 storage cells, which can be placed on a shelf in the cellar. Such cells, which can now be obtained in the open market, would be capable of furnishing current for 15 lamps, and one charging of 12 hours would, with the ordinary number of hours of lighting, last for 3 days, provided all of the 15 lamps were lighted at the same time. Where the number of lamps is less, the time required for the battery to become discharged would be still further prolonged. A dynamo of 3,000 volts, E. M. F., and having a current of 20 amperes for your purposes, or two arc dynamos, giving each a 10-ampere current, coupled in parallel, would be able to furnish current for 50 houses, each absorbing 60 volts, E. M. F. The conductor required for the purpose need not be greater than a No. 4 B. & S. wire.

To make the system perfect, suitable automatic switches can be arranged in each house, which would cut out the battery when the latter is fully charged and throw it into circuit again when discharged. In this manner it is probable that considerably more than 50 houses could be supplied from a 3,000-volt circuit, as not all of the batteries would be exhausted or charging at the same time. Here, then, is one method by which, without a very greatly increased expense, the earning capacity of electric plants can be increased, and I believe the time has come when you should seriously consider the working of the field here presented.

But there is still another way in which the storage battery can be made to do good service for incandescent lighting from arc light stations. As stated before, the dynamos at the station are idle for a large fraction of the day. Now, nothing would be more simple than to charge the storage cells in series at a station during the daytime, and then couple them in quantity, so that they could be connected to incandescent circuits radiating from the central station, which would thus be virtually a secondary battery station. It is a well-established fact that incandescent lamps are not used on an average more than four hours per day, the current required in incandescent circuits during the remaining twenty hours not reaching 15 per cent. of the maximum called for during lighting hours.

Let us again take for example a station having only three 40-light dynamos of about 2,000 volts and 10 amperes each. By coupling these in parallel we would obtain a current of 2,000 volts E. M. F., and 30 amperes. This current from 6 A. M. to 4 A. M., or ten hours, could be used to charge a battery of 1,000 storage cells, delivering to each cell 30 amperes for ten hours; that is, 300 ampere hours. Now, at four o'clock these 1,000 cells which have during the charging been connected in series are changed about so as to be connected in 20 parallel rows of 50 cells each, thus giving an E. M. F. of 100 volts, suitable for incandescent lamps. Each of these twenty rows having a capacity of 300 ampere-hours the entire series of 20 are capable of delivering 6,000 ampere-hours at a potential of 100 volts. Now, if we suppose that with the resistance of the circuit each lamp requires 1 ampere it follows that 6,000 incandescent lamps could be lighted for one hour, or 1,500 for four hours, the maximum average lighting duration established by actual experience. Thus, by the mere addition of 1,000 cells to an arc light station with only three 40-light machines, we could, without the addition of any machinery whatever, by the mere adjunct of the storage battery, furnish current for 1,500 incandescent lamps, and maintain them with the utmost degree of steadiness.

What has just been stated with regard to arc light stations is equally true of incandescent light stations. Instead of having the majority of machines idle during 18 hours out of twenty-four, a few machines might be run continuously, charging storage batteries which would furnish the supply of current needed during the busy hours.

Such a station, the first of its kind in the world, I believe, is now in course of construction at Haverford, not far from this city of Philadelphia, and I am convinced that the results which will be obtained will justify courageous wisdom on the part of its projectors.

I believe I have shown that those principally interested in arc lighting have a number of paths open to them by which they can with profit add the incandescent light, or for that matter electric motors, to their business. I need only remind them that the street lighting, which most of them are engaged in at present, embraces only 5 per cent. of the total lighting done in this country, and that of the remaining 95 per cent., according to our present knowledge, only 5 per cent. more can be touched by the arc light. The remaining 90 per cent. must be done by incandescent lighting.

Big Gas Bills Paid on Account of Household Consumption.

A recent issue of Mr. Dana's latest venture in the field of newspaperdom (the *Evening Sun*) contained the following:

"What private individual pays the biggest gas bill in the city, did you say? Well, that is a funny question, but I think I can answer it," said an old clerk of the Consolidated Gas Company. "Let me see," he mused; "I think Pierre Lorillard goes ahead of anybody in that respect. Yes, he leads the list with from $300 to $400 a month for gas consumed in his house, and he is a very prompt payer, too—sends a check for the amount as soon as the bill is turned in, and never kicks at all."

"Never kicks?"

"No, never; which is saying a good deal. Some of the rich men who don't burn much more than a tenth of the amount Mr. Lorillard uses will haggle over the bill, and swear that the meter must be wrong by the half hour at a time. Take William Rhinelander, for example. His bill amounts to a little over $40 a month, and he always finds fault with it. He has his little talk first, and then pays it in brand new bills. Counts 'em over three or four times, too.

"A. T. Stewart was very close about his gas. That big white marble palace of his at Thirty-fourth street and Fifth avenue couldn't have been very brilliantly lighted at night when he was alive, for his gas bill was seldom over $20 and never went beyond $25. Of course these figures are for the winter months, when the people are at home.

"Judge Hilton lights things up in his house at 1 Thirty-fourth street in a much more lively style than did his old partner and neighbor. His bill generally takes a $150 check to settle it, and often it goes over that amount.

"The Vanderbilt houses on Fifth avenue and Fifty-second street range from $200 to $250 a month each in the winter. Sometimes the bill is bigger, but not often.

"A. B. Stockwell used to burn $150 worth of gas in a month, but he's not doing it nowadays.

"I remember two old maids who lived for many years in a big house on Madison avenue near Thirty-fourth street. Their bill never went above $3 or $4 a month. They made their servants use candles in their rooms. Lots of wealthy people do that. They think a tallow dip is good enough for a servant, but they spend hundreds of dollars for their own chandeliers. Well, these two old maids rented their house to another family last year, and the same meter now measures out $75 to $100 worth of gas a month.

"There used to be an old Irishman named Judge who owned lots of houses and flats on the east side up town. He was a builder, and was putting up flat houses all the time. His gas bill was never over 50 cents a month. He lived in one of his own flats on East Fifty-second street, but his gas bill hardly paid for the wear and tear of the meter. He always was on hand when our man examined the meter, and could read it to the fraction of a cent, I believe.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

ANOTHER DECISION IN FAVOR OF THE OWNERS OF THE OTTO PATENTS.—The proprietors of the Gas-motoren-fabrik Deutz, of Deutz, Germany, owners of the Otto gas engine patents for Germany, to whose operations much attention has recently been attracted, because of the large sizes of Otto engines constructed by them and furnished for power purposes to city water works and important electric lighting installations, have just obtained a decision in their favor in their suit against Moritz Hille, of Dresden, a manufacturer, and several of his clients who were users of infringing engines. The decision establishes the infringement by the defendants, orders them to discontinue the manufacture and use of the machines, also to account for damages. The Hille engine employed the now well-known Otto four-stroke cycle. The suits now pending against Korting Bros., and Buss, Sombart & Company, are also based on that application. In the latter cases a decision may soon be expected.

AN INTERESTING LEGAL DECISION.—Some time since the City Engineer of Little Falls, N. Y., entered into contract with Messrs. Sullivan & Company to make extension of the city's system of water supply conduits. During the progress of the work Sullivan's employees, through carelessness, fractured a main of the Little Falls Gas Light Company, whereby the latter lost upwards of 30,000 cubic feet of gas. Sullivan, backed by the advice of the City Engineer, refused to pay the gas company's bill for same (involving about $81, at the rate paid by ordinary consumers), and the law was invoked. The case was tried before Justice Sherman, and a jury, who, on the evening of April 5th, returned a verdict in favor of the plaintiffs, damages being fixed in the sum of $47.66. That adjustment was based on the probable gross cost to the Gas Company of the gas at the point where the escape occurred. The proprietors of the Gas Company are satisfied over the result, because it confirms the validity of their right to occupy the streets, and thus

upsets the claim of the City Engineer, who informed Sullivan & Co., in case the gas pipes interfered with the water conduits, that they (the contractors) might cut the gas pipes out. Sullivan & Co. will not appeal from the verdict of the jury; and we do not suppose they could expect to gain much by appealing to the sense of justice possessed by the City Engineer.

PUBLIC LIGHTING AT ANNAPOLIS, MD.—The authorities of Annapolis have authorized the Annapolis Gas Company to light 90 street lamps for one year, at $18 each, burners to be of size employed in Baltimore, and hours of lighting to be based on an agreed-upon moon-table.

NEW HAVEN (CONN.) GAS SUPPLY.—Water gas is being supplied at the present time to the residents of New Haven; but the service will probably not be permanently continued. According to the New Haven *Courier* the present daily gas consumption in the city ranges between 400,000 and 450,000 cubic feet.

THE QUALITY OF OMAHA (NEB.) GAS.—Mr. Jas. Gilbert, Gas Inspector for Omaha, reports that he has been investigating the quality of gas supplied in that city pretty closely during the last seven weeks. He decides, as the result of his investigation, that "The present quality of gas condenses with too great rapidity, and, therefore, is not suited for use in cold climates." He further avers that 31 tests made in the seven weeks gave an average illuminating power of 17 candles; and that a variation of 8 candles in one 24 hours was noted by the photometer—cause, fall of 50° in temperature in less than 6 hours.

ADDING TO THE PLANT.—At the New England meeting, last February, Mr. Geo. B. Neal said it was quite likely the electric plant of the Charlestown (Mass.) Gas and Electric Light Company would soon be increased. This extension has been determined on; and, among other items, we note that the Jarvis Engineering Company, of Boston, Mass., will supply the Charlestown folks with another tubular boiler, with Jarvis boiler setting for consuming screenings for fuel, also two additional Armington & Sims' pattern of engines.

CARTHAGE (N. Y.) TO BE LIGHTED BY ELECTRICITY.—At a special charter election in the village of Carthage the taxpayers expressed their preferences (by ballot) in the matter of public lighting for the ensuing year. The result of the vote was as follows: In favor of electricity, 119; against, 97. The work of preparation to carry out the voter's wishes is now in progress.

DO THEY EXPECT TO DEFEAT THE GENERAL?—A certificate incorporating the Equitable Gas, Light and Fuel Company, of Cincinnati, Ohio, was recently filed with the Secretary of State. The capital stock is placed at $3,000,000. Perhaps the inhabitants of the Paris of America had better hunt up the operations of the Equitable Company's various schemes in Chicago, Baltimore, Syracuse, Newark, New York, San Francisco, etc. But, come to think of it, General Hickenlooper lives in America's Paris.

CHEAPER GAS FOR DAYTON, OHIO.—Brief notice was given in our last issue of the great advance made by the managers of the Dayton Gas Light and Coke Company in the direction of the "dollar-a-thousand" winning post. The following is Secretary Smart's official announcement of the action of the Dayton Company's Board of Directors in the premises: "*Resolved*, That on and after April 1st, 1887, the price of gas be reduced to $1.25 per thousand cubic feet, and a discount of 10 cents per thousand cubic feet be allowed on all bills for gas paid at the office of the Company on or before the fifth of the month, or $1.15 net." Perhaps we could explain the way in which this action is regarded by the Daytonites in no better manner than by reproducing the following comment from the columns of the Dayton *Herald*: "This action gives Dayton the benefit of cheaper gas than any other city of its size in the Union, and clearly shows that our old reliable Gas Company means to keep abreast with the times. A little thought will show how much lower $1.15 per 1,000 cubic feet in Dayton is than the same price in larger cities, where the day consumption is greater than the day and night consumption in Dayton; and that, too, in those cities where coal is at least 30 per cent. lower than it can be bought in this city. Under all considerations, the reduction of more than 23 per cent. in the cost of gas to the consumer is one that should be appreciated by the people. Our Dayton gas is noted all over the country as being of superior quality." The Dayton reduction offers a possible reason for Brother Joseph Light's silence at the recent Ohio meeting. He must have been indulging in "a heap of thinking," and now breaks his "golden silence" in a volume of silvery sound. Long may the Dayton Company continue to indulge in the smart practice of selling light at low figures.

CHEAPER GAS FOR BURLINGTON, IOWA.—The proprietors of the Burlington Gas Light Company have established a gross rate of $2.25 per thousand cubic feet, but in consideration of prompt payment a discount of 25 cents is allowed. In announcing the reduction the proprietors said: "This saving to you of one dime is the first step toward a further reduction. Help us towards that good end." To which we respond, "Amen!"

THE GAS WORKS ARE COMPLETED.—On the evening of March 26th gas was sent out from the recently completed works of the Marshall (Texas) Gas Light Company. Everything worked smoothly, and the inhabitants voted that Marshall had at last "taken her place among the cities of the State." Good enough; may they long continue to hold their gas suppliers in similar esteem. We fear, however, for what the future may reveal in that respect. Marshall starts out with 25 public street lamps, and the local plumbers are busily engaged in piping the houses of those who will shortly eschew the fatal kerosene.

BRISK COKE TRADE AT MILWAUKEE, WIS.—The Milwaukee Gas Company reports a large increase in the local trade for coke during the past winter. The most encouraging feature in the affair is that the great bulk of the demand came from those who used it for domestic purposes. Prepared coke is a cheap, cleanly and convenient fuel.

MAKING SURE OF THEIR POSITION.—It will be remembered that when the floods of last spring caused such confusion and loss in the lower portion of the city of Montreal, Can., one of the greatest annoyances sprang from the fact of the tides having put out the fires of the Ottawa street station of the Gas Company. This stoppage plunged the northern and western districts of the city in darkness; but all danger of a similar happening in the future has been averted by the placing of a main leading from the Hochelaga station to Cote ste Antoine, along Catherine street.

CHEAPER GAS FOR MIDDLETOWN, CONN.—The directors of the Middletown Gas Light Company voted, on the last day of March, to reduce the rate for gas, from $2.60 to $2.10 per thousand cubic feet, a discount of 10 cents to be allowed for prompt payment. The Company has purchased a plot of land on East Court street, where an electric lighting plant is to be established. Both arc and incandescent lights will be supplied.

BROTHER SCOFIELD CONVERTS THE COUNCIL.—And every gas man knows how hard a task that is to accomplish—without resorting to the principle involved in "combines"—*a la* Jachne, McQuade, and others. A year ago the City Council of Fort Scott, Kansas, gave a contract to the Sperry Electric Light Company to light the public lamps. Brother Scofield thereupon became a very downcast man; but as the righteous must eventually prevail, and their reward be quadrupled as recompense for the weary season of sackcloth and ashes, behold Brother S.'s victory over the wiles of the heterodox. Briefly told, the following is his reward. Shortly before the termination of the Sperry contract, which was very imperfectly performed, the Council authorized that a contract be made between the city and the Fort Scott Gas Light Company, to last for two years from first inst., under which the latter was to be paid for a total of 250 public lamps. The Gas Company, prior to the advent of the Sperry Company, was under contract to supply but 58 lamps, hence Brother Scofield's sudden admiration for the promoters of electric lighting. He closes his letter to us on the subject by remarking, "I hope to meet you all again in St. Louis next month to sympathize with those in affliction, and to rejoice with those who are *happy*." Not much weight of woe about the Fort Scott gas man at the present writing, and, under the circumstances, why should there be? Only 58 public lamps a year ago, and 250 now, after waiting only a twelvemonth! Well!!

MUNICH BENCHES FOR THE BOSTON GAS WORKS.—Mr. Emil Lenz is under contract to erect two benches of 6's, after the Munich system, at the works of the Boston (Mass.) Gas Light Company.

BARTLETT, HAYWARD & COMPANY HAVE PLENTY OF WORK.—Among the contracts recently made by the firm of Bartlett, Hayward & Company, of Baltimore, Md., we instance the following: Consolidated Gas Company, N. Y. City; telescopic gas holder; outer section 92 ft. 6 in., inner section, 91 ft.; sections in 26 ft. lifts; spherical crown; suspension frame of 10 wrought iron columns. This holder is to be located at 65th street and 10th avenue, and will be finished by August first. Haverhill (Mass.) Gas Light Co.; telescopic holder; outer section, 101 ft. 6 in., inner section, 100 feet ft.; sections in 26 ft. lifts; 10 wrought iron column supension frame. Lowell (Mass.) Gas Light Company; telescopic holder; outer section, 130 ft., inner section, 128 ft.; both sections in 30 ft. lifts; 12 wrought iron column suspension frame. Standard Gas Light Company, N. Y. City; one set purifying boxes (24 by 20) complete, with centre seal, connections and covers; also, 12 large generators, with hydraulic main, stacks, etc., Worcester (Mass.) Gas Light Company; single lift holder, 63 by 20. Looking over the above list it would seem as if the present flight of birds over Chesapeake's famous waters will have nothing to fear from Brother Hayward's fowling piece—not that we mean to say he could not "fetch" the canvass-back in the latter's

flight over punt or battery; but simply because the establishment at Pratt and Scott streets will keep him from a "visit to the Bay."

OTHER WORK BEING DONE BY THE CONSOLIDATED.—In addition to the holder to be erected for the Consolidated Company, as noted in Bartlett & Hayward's contracts underway, we note that Mr. Jas. R. Floyd is to erect a set of 4 purifying boxes at the 14th street station; Mr. Thos. F. Rowland to perform a similar task at the 21st street station.

CHANGES IN THE BIRMINGHAM (ALA.) GAS FRANCHISE.—On the evening of March 30, the City Council of Birmingham approved of certain changes in the franchise for supplying gas in that city. Under a new arrangement the city is to take $50,000 of stock in the Gas Company, and will be allowed one-half representation in the board of directors, there being six of the latter. It is stipulated that the city shall pay only $1 per thousand for gas; private consumers, $1.50. The prices formerly agreed upon were $2 and $2.50.

CHANGES AT UTICA, N. Y.—The Utica Gas Light Company and the Central New York Electric Light and Power Company have been consolidated under the name of the "Utica Electric and Gas Company." The Company is capitalized in $300,000. The officers are Messrs. W. J. Bacon, President; E. A. Graham, Vice-President; W. P. Fish, Treasurer and General Manager; Thos. A. Mooney, Secretary; Jno. W. Bates, Engineer.

KENTUCKY GAS NOTES.—Marysville, although a small place, boasts of a pair of coal gas works. The original company was charging $3 per thousand until last Fall, when parties from Cincinnati (Ohio) agreed to furnish gas at $1.50. The new company (the Citizens) has been in operation about six months, and since the first of the year both companies have been selling gas at 75 cents per thousand. In October a franchise was given to Salomon Salomon, and associates, of Louisville, by the Winchester Council authorizing them to erect a gas works in Winchester, provided plant construction was begun not later than the 15th inst. Late advices say that operations have not yet commenced. Mr. Jno. Wright, who has been Superintendent of the Bowling Green Plant for many years is, we are pained to say, very dangerously ill. The sufferer is well known and universally liked by his associates throughout the State; and all will regret to hear of his precarious condition. Mr. Meyers, who, as noted some time ago in our item columns, is in charge of the model gas plant at Paducah, is busily engaged in preparing the tank for the 70-foot holder now in course of construction by Messrs. Deily & Fowler, of Philadelphia. The Henderson gas works are owned by the city, Mr. Wm. Cannings being in charge thereof. The business of gas supply has increased to such an extent that Supt. Cannings has been authorized to provide for the new conditions of things by putting up four new benches of sixes; new scrubber and condensers; a new holder; and about one mile of main pipes. He certainly will have his hands full this spring in carrying out the improvements, but, nevertheless is eager and anxious to get at work.

A BRISK TRADE.—Messrs. P. H. & F. M. Roots, of Connersville, Ind., report a decided improvement in the demand for gas exhausters. Recent shipments include a No. 2 exhauster (capacity, 250,000 cu. ft.) and engine, pipe fittings, gas and bye-pass valves, etc., to the Lafayette (Ind.) Gas Company; a No. 2 exhauster and engine to the order of Mr. Frederic Egner, of St. Louis, Mo.; and a No. 3 exhauster to the city of Mexico. They have also just received an order from the St. Louis (Mo.) Gas Light Company for an exhauster rated to pass five million cu. ft. in 24 hours. Several other negotiations are about to close successfully.

CHEAPER GAS FOR NATICK, MASS.—Supt. J. R. Todd, of the Natick Gas Light Company, has been authorized to notify the inhabitants of Natick, that the gross selling rate, from and after first inst., would be reduced from $3 to $2.70 per thousand cubic feet. Ordinary consumers who settle their accounts on or before the 15th day of the first month in each quarter will be entitled to a rebate of ten cents per thousand; and that rebate will be increased to 20 cents where the consumption in any one quarter reaches or exceeds 10,000 cu. ft. In the circular announcing the concession Supt. Todd calls attention to the annual cost of maintaining Lungren lamps, burning a certain number of hours on stated days of the month—the schedule was intended to make an impression on the proprietors of business places especially—at the new gas rates. The idea is an excellent one, and cannot fail of the object intended. The Natick works were built in 1875, and the initial gas rate was $4 per thousand. Hence it must be admitted that the Natick gas men are anxious to keep up with the procession.

ANNUAL MEETING OF THE MONTREAL GAS COMPANY.—The Fortieth annual meeting of the Montreal Gas Light Company was held on April 5th at the Ottawa street office. The President, Mr. Jesse Joseph, occupied the chair. A good attendance graced the occasion. From the annual reports read we glean the following of interest: The net earning of the year is returned at $240,096 46, out of which two semi-annual dividends (6 per cent. each) had been paid. The illuminating power of the gas supplied averaged 17.50 candles and the use of gas for cooking and heating has been extending. Coke has been in good demand, and the system of crushing coke has proved a success. The question of adding electric lighting to the business of the company had received attention, but no plans therefor had as yet been matured. The following extensions have been made: A coal shed at the Elm station, and a set of purifiers at the Ottawa station, besides many minor improvements in the general plant; 7,160 yards of street mains were put down; also, 454 new services. The work of putting down a new 20-inch main to supply the northern and western portions of the city is in progress. Work on the new gas holder at the Elm station is in a forward state. The old Methodist church and site, on Ottawa street, were purchased at a cost of $14.710. The total receipts for the year were $503,485.39. The capital stock is $1,938,476. The plant and property are valued at $2,035,965, and stock and materials on hand at $254,692, with cash on hand and in bank, $52,727. The President stated that the earnings were $10,000 more than last year, in spite of various depressing causes, such as the introduction of the electric light in the streets, Post Offie, *Gazette* office, Bank of Montreal, and elsewhere. The increase in the number of consumers was 789. The proposed gas holder would increase their daily storage capacity by one million cubic feet. It would be necessary to shortly commence the erection of a new retort house, which, with the new main and the gasholder, would entail an expenditure of over $200,000. He (the President) called attention to the fact that it would be necessary to borrow money to meet that obligation. A shareholder (Mr. Delisle) asked if the company were poorer because of the competition of the electric light. In reply the President said, on the contrary, the consumption of gas had increased. It was moved that the stockholders authorize the management to borrow a sum not to exceed $320,000, at an interest rate not exceeding 6 per cent. per annum, with power to issue bonds, if necessary, the money to be used in extending and paying for the facilites of the company. It was explained that, in all probability, not over $250,000 would be required. Mr. Crawford opposed the motion, but it was finally decided in the affirmative. Mr. Crawford offered a resolution that hereafter dividends be declared quarterly instead of semi-annually, which was acquiesced in. The former board of directors was re-elected, and the meeting then adjourned. The largest single shareholder in the company appears to be the City and District Savings Bank, with a holding of 5,056 shares. The Hochelaga Bank holds 580 shares.

WILL ILLINOIS HAVE A GAS COMMISSION?—It is understood that Senator H. W. Leman will endeavor to secure the passage of a bill by the Illinois State Legislature creating a gas commission for the purpose of regulating the business of gas companies in that State. So far as known the proposed act calls for the appointment of a commission to consist of three persons; term of office, two years; salary, $3,500.

BROUGHT INTO THE COURTS.—Advices from Chicago (Ills.), bearing date of April 8th, say that, upon application of Mr. Thos. Leaming, counsel for the American Gas Company, of Phila., Pa., the Circuit Court, on April 7th, granted an injunction restraining Mr. T. M. Avery, and others interested in the National Gas Light and Fuel Company, of Chicago, as also the Mayor and Town Council of Elgin, Ills., from tearing up the streets of that town for the purpose of supplying water gas manufactured under the Springer process. When the American Gas Company bought out the original Elgin Gas Company several weeks ago the new owners acquired an existing exclusive franchise which had been granted by the municipal authorities for a term of years. The National Company then secured the passage of another ordinance permitting competition, thus conflicting with the original company's franchise. A bond in a large sum was required to be filed, but the injunction issued restrains the approval of any bond by the Mayor, the erection of the competing works, or the publication of warnings calculated to injure the existing company's business or franchise, now owned by the American Company.

NOT SO PROSPEROUS.—From the semi-annual report to the shareholders of the Crystal Palace District (London) Gas Company, for the six months ended Dec. 31st, 1886—the report was made to the shareholders on March 18th—we learn, to use the words of the directors, "That the mild weather during nearly the whole of the last half year, the reduction in the price of gas to 2s. 9d. per thousand cubic feet, and the heavy and continued fall in the selling price of coke and tar, have produced a result on the revenue account not quite so satisfactory as usual." Nevertheless the shareholders received the following dividend awards: 3 per cent. on the preference stock; 3½ per cent. on the ordinary 7 per cent. stock; 5 per cent. on the ordinary 10 per cent. stock; and 3½ per cent. on the new ordinary 7 per cent. shares. The statement of make and disposition of gas during the half year is as follows: In store, June 30th, 2,683,000 cubic feet; made during half year,

347,465,000; registered on meters, 300,869,360 cubic feet; estimated for public lamps, 22,650,000 cubic feet; total sold, 323,519,300; used on works, etc., 3,823,700 cubic feet; total accounted for, 327,343,000; not accounted for, 20,998,000; in store, 31st December, 1,807,000 cubic feet.

EVERYTHING WORKING SMOOTHLY IN BROTHER DENNISTON'S DISTRICT.—The Critchlow process plant put up in the East End works at Pittsburgh, Pa., is working along in a most satisfactory manner. The illuminating power of the product under the new plan of operation pleases the consumers. In concluding an article descriptive of the East End works, the *East End News* says: "It will not be uninteresting to our readers to know that the East End Gas Company, starting 15 years ago, with but few consumers, and furnishing a 14 to 16-candle power gas at $3 per thousand, has grown, under the management of Mr. W. H. Denniston, to the point where it now supplies a 20-candle gas at $1.35 per thousand, has over 35 miles of mains, and conveys gas to over 1,200 consumers. Starting out with a capital of $50,000, the proprietors now have $250,000 invested; and although electric lights have taken the place of gas in a majority of the business houses, the amount of gas consumed is constantly increasing."

ANNUAL MEETING OF THE CHESAPEAKE GAS COMPANY.—The annual meeting of the stockholders in the Chesapeake Gas Company, of Baltimore, Md., was held in the office, corner of Hanover and Baltimore streets, on date of March 30th. Over two-thirds of the stock voted. The following Board of Directors (re-elections) was chosen: Messrs. D. D. Mallory, W. S. Carroll, Oliver Reeder, J. R. Clark, and C. F. Dieterich—all of Baltimore, with E. C. Benedict, C. F. Tag, E. N. Dickerson, and E. J. Jerzmanowski, all of New York. The Treasurer reported $132,000 cash on hand, and that all debts of every kind were paid, including the cost of the completion of the works, which have a per diem capacity of five million cubic feet. The list of subscribers or consumers is returned at about 14,750. At a subsequent meeting for organization the directors selected the following list of officers: President, C. F. Dieterich; Treasurer, W. S. Carroll; Secretary, O. Reeder. The question of a reduction in the price of gas to meet the cut of the Equitable Company was not brought up.

TO REBUILD.—It is understood that the Chattanooga (Tenn.) Gas Company will virtually rebuild its works. Care will be taken to place the apparatus at a safe height from freshet attacks.

TROY'S NEW RATE.—The new gas rate at Troy, N. Y., took effect on first inst.; $2 per thousand is to be the rule, with a special discount to large consumers.

THE ORLANDO (FLA.) PLANT.—It was expected that construction work on the new plant at Orlando would begin on April first. The capital stock has all been placed.

A NOTED WALTHAM FACTORY.—When the name of Waltham (Mass.) is mentioned the average mind will at once recur to the thought that there is the home of the famous American Waltham Watch Company; but this bustling city possesses many other busy hives. In fact the average gas man will be inclined to identify Waltham as the headquarters of the Davis & Farnum Manufacturing Company; and those who thus think have reason for their remembrance, because Messrs. Davis & Farnum have constructed gas plants in many sections of the country. The Waltham Board of Trade recently published a handsomely illustrated pamphlet descriptive of the "Advantages of the City of Waltham to Manufacturers, and as a Place of Residence," compiled by Mr. E. L. Barry, and from it we extract the following, in regard to the establishment of Messrs. Davis & Farnum:

"The extensive works of this Company are situated beside the Watertown Branch Railroad, a short distance east of the Bleachery station. The business was originally established in 1844, by Mr. R. P. Davis, in a building near the Moody street crossing of the Fitchburg Railroad. After a few years it passed into the hands of Mr. F. J. Davis, who, in 1860, in order to meet the demands of an increasing business, erected a much larger foundry on Felton street, it being the building now used by Mr. Francis Buttrick for the storage of lumber. In a short time after this latter date Mr. John R. Farnum became interested in the business, and a partnership was formed under the style of Davis & Farnum, which was changed to the Davis & Farnum Manufacturing Company, in 1876.

"In the meantime the facilities afforded by the plant on Felton street were completely outgrown, owing principally to the excellent reputation established by the firm in certain lines of its manufactures, and therefore to give the necessary increase in productive capacity, the present extensive works were erected and occupied in 1870. They consist of a foundry building, 250 by 125 feet, provided with three cupolas having a combined capacity of melting thirty-five tons of iron per day, running a three-hour heat, a pattern shop, and a pattern storage building, each about 100 feet square, a sheet iron shop, about 100 by 50 feet, and an office building, besides several tenement houses for the accommodation of the workmen and their families. The works are fully equipped in every way, and are capable of producing a large amount of work, upwards of 150 persons being employed in the busiest seasons.

"The Company does a general foundry business, its operations including the manufacture of large quantities of water and gas pipe, and special castings for water and gas companies, the construction of iron roofs, and any kind of iron castings that may be desired.

"Its specialty is the production of complete plants for coal gas works, embracing all the machinery and other apparatus in use by them. Among the gas works erected by the Company may be mentioned those at St. Johns, N. B., Decatur, Cairo and Centralia, Ills., Vincennes, Ind., Vineland, N. J., Bath, N. Y., Palatka, Fla., Spencer, Mass., Westerly, R. I., Waltham, Mass., and others. In addition the Company has reconstructed and made additions to almost every New England gas company's works, and other similar works in different sections of the country.

"Some of the plants mentioned above are quite extensive, and the manner in which they have been constructed, and the successful operation of all the varied apparatus have elicited for the company much favorable comment. Therefore the assertion can be safely made that no other company has given better satisfaction in this line than has the Davis & Farnum Manufacturing Company.

"The Company has excellent facilities for handling its manufactures. It is connected by side-track with the Fitchburg Railroad, and besides employs from 12 to 15 horses in transporting manufactured goods and raw materials.

STREET LIGHTING AT WHITE PLAINS, N. Y.—An attempt has been made to start an opposition movement in White Plains by reviving an old charter which, it is claimed, had lapsed through the failure of the original grantees to perform within the specified time the work of construction. Those interested in the resurrection proceedings appeared before the town Council and asked that a contract for public lighting be granted them at the figure of $18 per year per lamp. The White Plains Company, which had performed the lighting for some years, receiving therefor $25 for each lamp, met the reduction by offering to accept the figure of the newcomers; thereupon the latter expressed willingness to accept $17 a lamp. The Council, however, awarded the contract (at $18) to the old Company.

THE GRAND ISLAND GAS COMPANY.—Messrs. A. S. Maxwell, S. N. Walbach, and J. L. Means are named as the incorporators of the Grand Island (Neb.) Gas Company. The Company is capitalized in $50,000.

ELECTRIC LIGHT FOR DOVER, N. H.—The Dover Board of Aldermen, on April 7, granted H. W. Burgess, of Boston, Mass., the right to erect and maintain a Thomson-Houston electric lighting plant in their city. They guarantee him an exclusive privilege for five years.

Correspondence

(The JOURNAL is not responsible for the opinions expressed by correspondents.)

Piping Rules in Force at Indianapolis, Ind.

ENGINEER'S OFFICE, INDIANAPOLIS GAS LT. AND COKE CO.,
INDIANAPOLIS, IND., April 9th, 1887.

To the Editor AMERICAN GAS LIGHT JOURNAL:

I notice your item regarding the Worcester (Mass.) gas hearing before the State Gas Commission, in which you very justly say, "It is almost time that the owners of large factory buildings comprehended the fact that a half-inch riser cannot be depended upon to supply a sufficiency of gas to one hundred gas burners." I should think not indeed! I inclose you a card of "Rules and Regulations" which we send to every gasfitter, builder, and architect in the city. I may add that I have found no disposition by anyone to evade these rules, and that there is no difficulty in having them complied with.

Yours very truly, JAS. SOMERVILLE.

Rules and Regulations of the Indianapolis Gas Light and Coke Company for the Guidance of Gasfitters.

Size of Tubing.	Greatest Length Allowed.	Greatest No. of Burners.	Size of Meter.	Greatest No of Burners.
⅜ inch.	6 feet.	1	3 light.	5
½ "	20 "	4	5 "	10
¾ "	40 "	15	10 "	20
1 "	50 "	25	20 "	40
1¼ "	75 "	40	30 "	60
1½ "	150 "	80	45 "	100
2 "	200 "	150	100 "	250

No ¼-inch pipe to be used as a riser; ⅜-inch pipe only to be used for vertical brackets; no riser to be placed within five feet of outside wall of building; caps not to be removed until required for fixtures.

The Gas Light Company will decline to lay the service pipe or set the meter unless the above rules and regulations are faithfully complied with.

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SATURDAY, APRIL 16, 1887.

The Manufacture of Sulphate of Ammonia from Waste Gases.

The *American Manufacturer*, in editorially commenting on the above, says that by reason of the large body of unoccupied land that can still be taken up, under our pre-emption laws, or that can be bought at a nominal figure in the West, as well as because of the cheapness of land in the older States, the question of artificial manures has not assumed the importance with us that it has in the thickly populated countries of Europe, the soil of which has been worn out by centuries of cultivation.

In these countries the attention of the communities has been directed to methods of saving the ammoniacal liquors given off in the process of gas making, or of consuming coal in large quantities in any industries—such as coke making and blast furnace operations. Quite a number of English plants have already been adapted to washing of these gases and the recovery of the ammonia and other products of the tar and liquors. So also, in some of the coking districts of England, France, Germany, and probably other countries, the waste gases generated in the manufacture of coke, in addition to being utilized in the flue ovens to aid in the carbonization of coke, have their tar and other valuable ingredients utilized.

These waste gases are chiefly used in the manufacture of sulphate of ammonia, or ammonium sulphate. A recent calculation as to the amount of gas gotten out, of ammonium sulphate produced, and the cost of producing the same by what is known as the Ginniberg apparatus, has been made. The amount of gas liquor obtained by carbonizing a certain amount of coal, at 5½ Twaddell, was about 3,500 tons, and from these 3,500 tons about 389 tons of ammonia sulphate can be produced at the following cost:

Material.	Tons.	Price.	£	s.	d.
Sulphuric acid at 60° Be.....	389	40s.	777	0	0
Lime	71	12s. 6d.	44	7	6
Labor, 4 men, 50 weeks each, at	..	25s.	250	0	0
Coal.....	175	8s.	70	0	0
Casks and packing.....	..	..	155	12	0
Sundries, repairs, etc.....	..	..	116	14	0
Depreciation on plant, £300; buildings, £150; total, £450..	..	@ 10 p.ct.	45	0	0
Interest on plant and buildings, £450; land, £100; total, £500..	..	@ 5 p.ct.	25	10	0
Gas liquor, at 5½° Tw.....	3,500	12s.	2.100	0	0
Total cost of manufacturing sulphate of ammonia.....	..	..	£3,587	3	6

Taking the price of sulphate ammonia as 11s., the following figures are obtained:

	Tons.	Price.	£	s.	d.
Sulphate of ammonia obtained as above.....	389	11s.	4,279	0	0
Cost of manufacture as above ..	..	..	3,587	3	6
Profit	..	..	691	16	6

Although, as already stated, the necessity for the utilization of the waste gases from our coke ovens and blast furnaces is not as pressing as it is in England, the waste is still so enormous as to justify a careful investigation by the proprietors of these works into the methods of the recovery of the waste products. On the basis of the calculation above given, the daily waste in the Connellsville coke region alone would be equal to the production of half of the amount of liquor assumed in the above calculation, and consequently half the amount of sulphate of ammonia, or nearly 200 tons per day.

The Market for Gas Securities.

The market for city gas shares continues dull, if not listless. Consolidated dealings are few and unimportant, little or no inquiry on the part of investment purchasers being made. Noon to-day (April 14) the bid price is 84½, holders offering at 85. Equitable is steady, and Mutual slightly weaker, although there seems to be no special reason for it. In fact Mutual looks like a purchase at current quotations. In our item columns notice is given that the proprietors of the Standard Company have made some important construction contracts with Messrs. Bartlett, Hayward & Co., and that action certainly gives color to the pale promises hitherto put forward by the Standard Company's promoters. The Brooklyn situation has a decidedly hopeful appearance, despite the fact the Griswold $1.60 rate will eventually become a law. This measure having passed the Senate and Assembly, was supposed to be ready for the Governor, but a flaw or defect in the title was subsequently discovered, and, as we understand it, up to time of writing at least, the "flaw" has not yet been "hammered" out. The proposed commission measure does not seem to make great progress, but there is time enough left in which to hurry it up. During first week of April about 225 shares of Washington (D. C.) gas changed hands at a range of 40¾ to 41¾. Transactions included one lot of 175 shares, the holder desiring to make a bond purchase, which went into strong hands. Possibly a bid of 43 (equal to 215 on par of 100) would now fail to elicit a response. Baltimore shares are higher, Consolidated being worth 66¼, and Chesapeake 81. We do not think that a mistake will be made by those who purchase at the noted figures. Equitable, of Chicago, is rated at from 88 to 90, and that security ought to afford a turn to buyers. St. Louis gas affairs are in a mixed condition, and holders of Laclede need have no fear as to the probable outcome. The Trust, to secure itself, must include that business in its territory, and will have to pay for it. San Francisco shares are strong and higher. Boston Gas Company's shares are more likely to cross the $1000 mark than to go back to $850. Rumors in regard to the Chicago situation are so plentiful and varied that the safest plan is to wait for future developments.

GAS WORKS DAMAGED BY FIRE.—At 1 P.M., April 9th, sparks from a passing engine on the Syracuse & Binghamton Railroad set fire to some portion of the works of the Cortland and Homer (N. Y.) Gas Light Company. Before the flames were extinguished a loss of about $3,000 was sustained.

PERSONAL.—Mr. Jos. Bate, formerly of Tiffin, Ohio, is now in charge of the American Gas Company's plant at Canton, Ohio. He assumed his new duties on 1st inst.

Gas Stocks.

Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks.

16 WALL ST., NEW YORK CITY.

APRIL 16.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

	Capital.	Par.	Bid	Asked
Consolidated.....	$35,430,000	100	84½	—
Central.....	440,000	50	30	—
" Scrip.....	220,000	—	47	57
Equitable.....	2,000,000	100	126	128
" Bonds.....	1,000,000	—	113	115
Harlem, Bonds.....	170,000	—	—	—
Metropolitan, Bonds....	658,000	—	110	113
Mutual.....	3,500,000	100	102	104
" Bonds.....	1,500,000	1000	101	—
Municipal, Bonds.....	750,000		—	—
Northern.....	125,000	50	30	—
" Scrip.....	108,000			
Yonkers.....		50	—	80
Richmond Co., S. I.....	300,000	50	50	—
" Bonds.....	12,000	—	—	—
Gas Co's of Brooklyn.				
Brooklyn..... ...	2,000,000	25	105	—
Citizens	1,200,000	20	55	—
" S. F. Bonds....	320,000	1000	—	103
Fulton Municipal.....	3,000,000	100	135	—
" Bonds....	300,000		—	106
Peoples	1,000,000	10	55	—
" Bonds	290,000	—	100	—
" "	250,000	—	100	—
Metropolitan.....	1,000,000	100	82	—
Nassau.....	1,000,000	25	102	—
" Ctfs.....	700,000	1000	100	—
Williamsburgh	1,000,000	50	129	—
" Bonds...	1,000,000	—	111	—
Out of Town Gas Companies.				
Boston (Mass.) Gas Co.	2,500,000	500	910	—
Buffalo Mutual, N. Y...	750,000	100	90	95
" Bonds...	200,000	1000	95	100
Citizens, Newark.....	1,000,000	50	140	145
" " Bonds.	45,000	—	—	—
Chicago Gas Co., Ills...	5,000,0000	25	142	145
Peoples G. L. & C. Co., Chicago, Ills	3,000,000		29	31
Cincinnati G. & C. Co..	6,000,000	100	184	185
Consolidated, Balt.....	6,000,000	100	66¼	—
" Bonds....	3,600,000		107	107½
Chesapeake, Balt.....	1,500,000	100	80	82
"	1,000,000		100	102
Consumers Toronto....	1,000,000	50	194½	196½
Central, S. F., Cal.....			82	—
Capital, Sacramento, Cal.			55½	58
Hartford, Conn.....	750,000	25	140	142
Jersey City.....	750,000	20	155	—
Laclede, St. Louis, Mo.	1,600,000	100	110	112
Louisville, Ky.....	2,570,000	50	130	132
Little Falls, N. Y.....	50,000	100	95	100
" Bonds	25,000	—	100	103
Montreal, Canada.....	2,000,000	100	209	215
New Haven, Conn.....		25	190	195

Oakland, Cal.....			36½	—
Peoples, Jersey City...		—	25	30
" " Bonds..			—	—
Paterson, N. J.....		25	90	—
Rochester, N. Y.....		50	75	80
St. Louis, Missouri.....	600,000	50	—	475
San Francisco Gas Co.				
San Francisco, Cal....	10,000,000	100	61	—
Memphis (Tenn.) Gas...	750,000	100	80	82
" Bonds.	240,000	100	103	—
Washington, D. C.....	2,000,000	20	210	—
Wilmington, Del.....		50	205	215
Havana (Cuba) Gas Co.	3,000,000	100	18	20
" Bonds....	550,000		102	—

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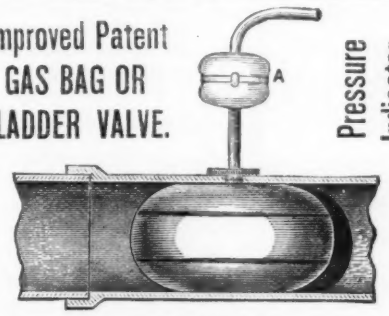

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THEO. FORSTALL, Prest.

THE CHICAGO GAS LIGHT AND COKE CO., Chicago, Ill., two No. 6 Gas Exhausters and Engine combined on same bed-plate.

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Messrs. P. H. & F. M. ROOTS, Connersville, Ind.: Dear Sirs—In 1872 one of your No. 5 Exhausters was placed in these works, and worked satisfactorily. March, 1885, it was replaced by one of your No. 6 Exhausters. The latter has been in almost constant use the past two years, has worked up to all my expectations, and is to-day in apparently as good condition as when first set up. It has not cost one cent for repairs in all that time. I have also had one of your No. 1 Exhausters, with Engine on same bed-plate, fitted with your valves and Huntoon Governor, placed in a small works under my control, and in its operation it seems as near perfection as I ever expect an Exhauster to become. Without in the least disparaging Exhausters of other makes, I may say that your Exhauster may be safely recommended as unsurpassed by any other, to those requiring such machines. Yours respectfully,

FREDERIC EGNER, Eng. and Supt.

CLEVELAND, OHIO, March 22, 1887.

Messrs. P. H. & F. M. ROOTS, Connersville, Ind.: Gentlemen—Concerning the Exhauster furnished this Company by you last fall, I can say but little—indeed, much need not be said. It simply does its work perfectly, and in a way that inspires confidence that it will not shirk its duty when one's back is turned. If I wanted another 1,000,000 capacity I should try and duplicate our No. 4. Very respectfully,

EDWARD LINDSLEY, Eng. and Supt.

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INDIANAPOLIS, IND., March 21, 1887.

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South Bend Gas Light Co., South Bend, Indiana.— Daily capacity, 250,000 cu. ft.
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Rathbun Company, Deseronto, Province Ontario.— Daily capacity, 80,000 cu. ft.
Jefferson City Gas Light Co., Jefferson City, Mo.— Daily capacity, 120,000 cu. ft.
Mankato Gas Light Company, Mankato, Minnesota.— Daily capacity, 80,000 cu. ft.
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1886

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GAS vs. ELECTRIC LIGHT.

We would invite attention to the able and exhaustive argument of General A. Hickenlooper, President of the Cincinnati Gas Light and Coke Company, contained in a handsome pamphlet of 96 pages, entitled

"EDISON'S INCANDESCENT ELECTRIC LIGHTS FOR STREET ILLUMINATION. REPORT OF AN ARGUMENT DELIVERED BY A. HICKENLOOPER BEFORE THE COMMITTEE ON LIGHT, MUNICIPAL COUNCIL, CITY OF CINCINNATI, JULY 22, 1886."

This is a subject of special interest to all Gas Light Companies.

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The first difficulty we overcome by selling our Exhausters at *extremely low prices*, as will readily be admitted after comparing our list with those of other manufacturers; and as to the second, we can say we have most convincing evidence from many companies operating our Exhausters that they can be used to advantage in works producing *as low as* 6,000 *cubic feet per day.*

In our improved Exhauster we combine the "Exhaust Tube" Gas and Steam Governors, Gas Compensator, and Bye-Pass Valves in the most compact form possible, which is a very great advantage to the machine, besides enabling us to manufacture and sell at the low prices given.

This is the only Exhauster in the market having a "compensator" in addition to the "gas governor"—a most important improvement, as it does away with all possible danger of their ever drawing air, and thus reducing the illuminating power of the gas.

FOR OIL GAS WORKS.

Our Exhausters are especially adapted for the use of Oil Gas Works; and where oil is required to dilute the gas a valve can be adjusted *to take the exact amount of air required*, thus dispensing with air pumps and their attendant labor and annoyance.

POINTS OF SUPERIORITY.

Requires *one-half the floor space* and *one-third less steam* than any other Exhauster in the market of same capacity. *More cheaply and easily connected*, as outside "Bye-Pass Valves" are dispensed with. It is the only Exhauster manufactured having "Compensator" and "Governor" *combined*, the "Compensator" with all other Exhausters being a separate and distinct machine. It is simple in construction, easily adjusted, not liable to get out of order, and *can be operated by ordinary workmen.*

NAPHTHALINE AND STEAM JET EXHAUSTERS.

As many superintendents of Gas Works believe the use of a Steam Jet Exhauster will inevitably cause trouble from *naphthaline* deposits, we recently sent out letters of inquiry to superintendents using our Steam Jet, asking for their experience, and the following replies speak for themselves. That naphthaline deposits are often unjustly attributed to Jet Exhausters is well known by many superintendents. When the cause cannot be determined it seems to be the rule to place the responsibility on the Jet Exhauster, *if they have one;* but if no Exhauster is used *the cause remains a mystery.*

OFFICE LISTOWEL GAS LT. CO., LISTOWEL, CAN., May 29, 1885.

Messrs. Connelly & Co., Ltd.: Gentlemen—The Exhauster purchased from you over three years ago, and now in use, has proven in every way all you claim for it, and has given us great satisfaction. No trouble has arisen from naphthaline.

Yours respectfully, F. W. HAY, Sec.

RICHMOND GAS CO., RICHMOND, KY, June 1, 1885.

Messrs. Connelly & Co., Ltd., 407 Broadway, N. Y: Gentlemen—I put in your Steam Jet Exhauster last November. I think it a perfect machine, as it requires no attention whatever. Have not had any naphthaline to contend with; it would be very easy to get rid of that substance if I had it. Yours very truly, J. B. GORDON, Supt.

HAMPTON, VA., June 3, 1885.

Messrs. Connelly & Co., Ltd.: Gents—We have been using your Steam Jet Exhauster for the past 3 years, and have never had any trouble with it whatever, either from naphthaline or any other source. Yours truly, J. B. H. GOFF.

BRUNSWICK, ME., May 27, 1885.

Messrs. Connelly & Co., Ltd.: Dear Sirs—Your favor of 23d inst. at hand. In answer would say your Exhauster works well with us. We make an oil gas; are not troubled with naphthaline. Very truly yours, B. G. DENNISON, Prest. Brunswick Gas Lt. Co.

WILMINGTON, O., June 15, 1885.

Messrs. Connelly & Co., Ltd.: Dear Sirs—We started your make of six-inch Steam Jet Exhauster March 30, and I am pleased to state, from the time the steam was turned on, it has performed its work to our entire satisfaction. We have never had any other but a Steam Jet Exhauster, and have never been troubled with naphthaline. For many reasons I prefer it to the "rotary," and have no hesitancy in recommending it.

Yours truly, E. W. HAMLIN, Sec. Gas Co.

OFFICE LOGAN GAS LT. & COKE CO., LAGAN, HOCKING CO., O., May 29, 1885.

Connelly & Co., Ltd.: Gentlemen—In answer to yours of 27th we have to say that the Steam Jet Exhauster put in for us by you last fall has been used constantly since, and, up to this time, we have had no trouble with naphthaline. We have heard many gas men say that a Steam Set Exhauster is liable to bring on trouble with naphthaline, and we have had that fear before us; but so far we have escaped, and we trust we may not have any experience with that gas manager's bugbear. Yours truly,

LOGAN GAS LT. & COKE CO.

OFFICE ATHENS GAS LT. CO., ATHENS, O., May 30, 1885.

Messrs. Connelly & Co., Ltd.: Dear Sirs—We take pleasure in giving you an unqualified endorsement of your Steam Jet Exhauster. It has been in place almost a year; been tested in all seasons and under all conditions; it has always proved true to the work assigned it. We have had no naphthaline deposit, nor any trouble chargeable to the Exhauster. Nothing but good has come from it, and *great* good at that. We can't do without it. Very truly yours, C. H. WELCH, Supt.

OFFICE MEADVILLE GAS WORKS, MEADVILLE, PA., May 29, 1885.

Connelly & Co., Ltd.: Gents—Yours of the 27th received and contents noted. Would say that after using your Steam Jet Exhauster for the past 18 months, find it perfectly satisfactory in every way. So far as naphthaline is concerned, we have had no trouble whatever as yet. Yours, GEO. S. CULLUM, Supt.

NYACK AND WARREN GAS LT. CO., NYACK, N. Y., May 25, 1885.

Connelly & Co., Ltd.: Gentlemen—Since your Jet Exhauster has been here there has been no trouble, and certainly *no naphthaline.* The only trouble I have experienced was the Jet becoming clogged with tar last week, and I cleaned it in a few minutes. It has run over three years without any trouble or cost for repairs. Yours truly,

A. MURRAY, Lessee and Manager.

OFFICE CADIZ GAS LT. CO., CADIZ, O., May 29, 1885.

Messrs. Connelly & Co., Ltd.: Gentlemen—Yours of 22d, inquiring how our Steam Jet Exhauster is doing, has been received. We have been using one of your Exhausters about four years, and with the best of satisfaction. We have less trouble with carbon in retorts, make more gas from same amount of coal than before, and have no trouble with stoppage in pipes or trouble from tar; and as regards naphthaline, we are not troubled with it, and do not know what it is to have any stoppage in pipes from naphthaline.

Very truly yours, A. N. HAMMOND, Sec.

SIDNEY (OHIO) GAS WORKS, June 1, 1885.

Connelly & Co., Ltd.: Gentlemen—We have now been using one of your Steam Jet Exhausters about five months, and thus far it has given us perfect satisfaction. We get a better yield and a more brilliant quality of gas from the coal. We have seen in papers and heard from different individuals that Steam Jet Exhausters were productive of naphthaline. "*We can't see it,*" as we have found no trace of it in the works, mains, services, or meters. Respectfully yours, W. W. GRAHAM, Supt.

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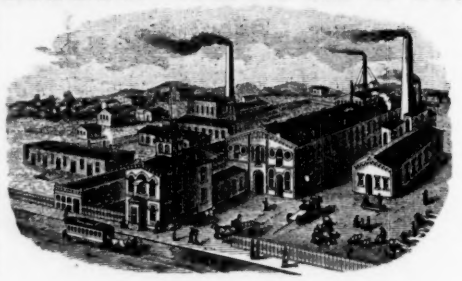

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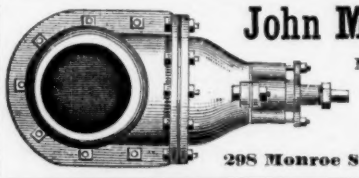

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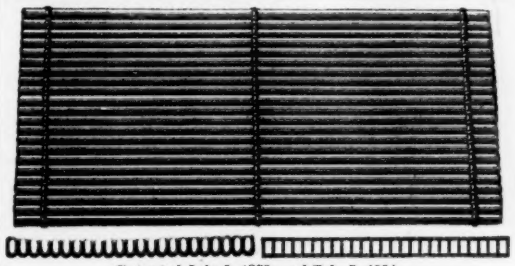

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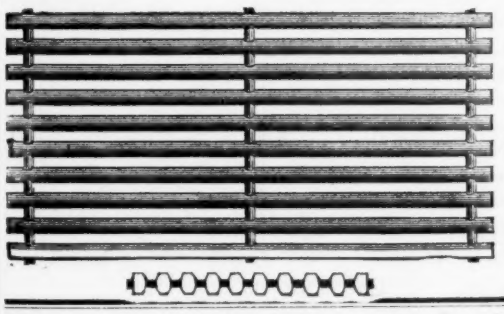

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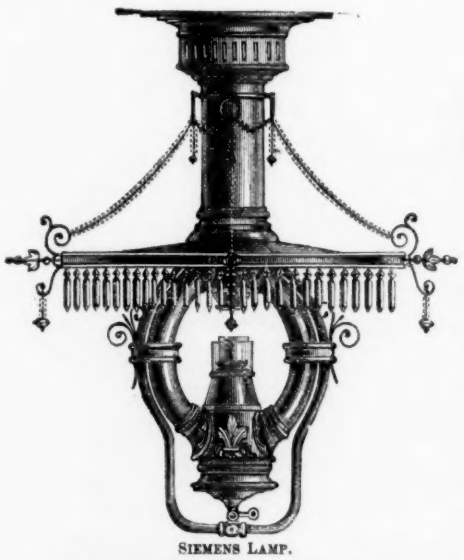

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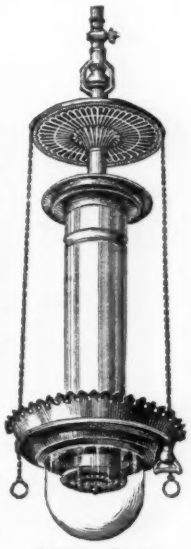

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BUFFALO, U. S. (MUTUAL)	500,000 "	TORONTO, CANADA	1,000,000 "
BERLIN, GERMANY	1,250,000 "	HARTFORD, U. S.	1,000,000 "
SO. BRISBANE, AUSTRALIA	300,000 "	DETROIT, U. S.	750,000 "
LEEDS, ENGLAND	2,000,000 "	SINGAPORE, CEYLON	300,000 "
FURTH, GERMANY	400,000 "	BRUNSWICK, GERMANY	300,000 "
FREIBURG, GERMANY	200,000 "	LILLE, FRANCE	750,000 "
NINE ELMS, LONDON	3,000,000 "	CADIZ, SPAIN	300,000 "
MELBOURNE, AUSTRALIA (2)	3,000,000 "	READING, ENGLAND	2,000,000 "
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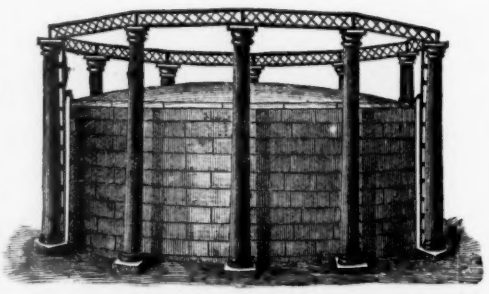

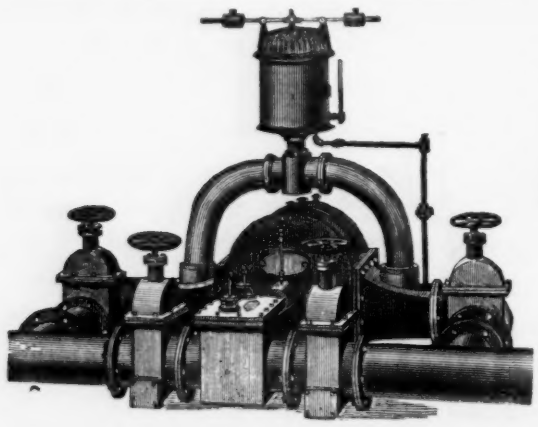

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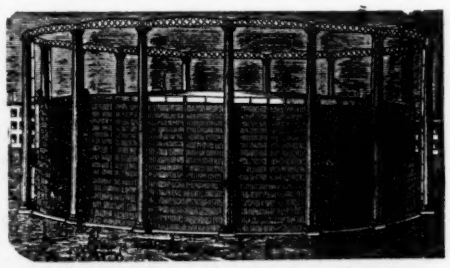

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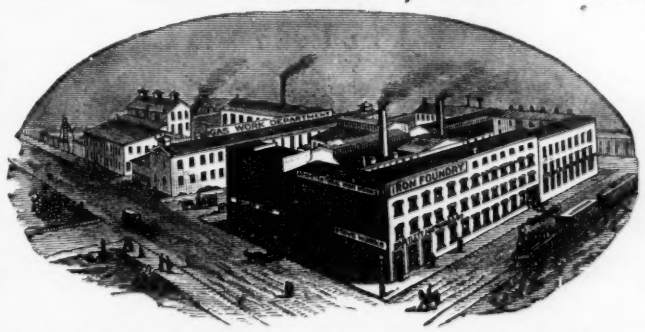

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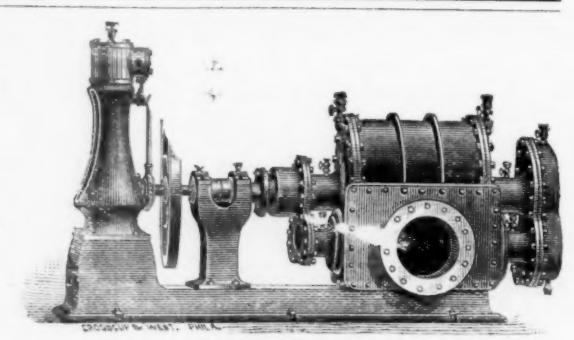

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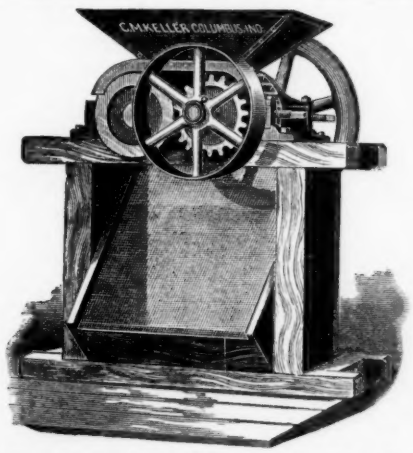

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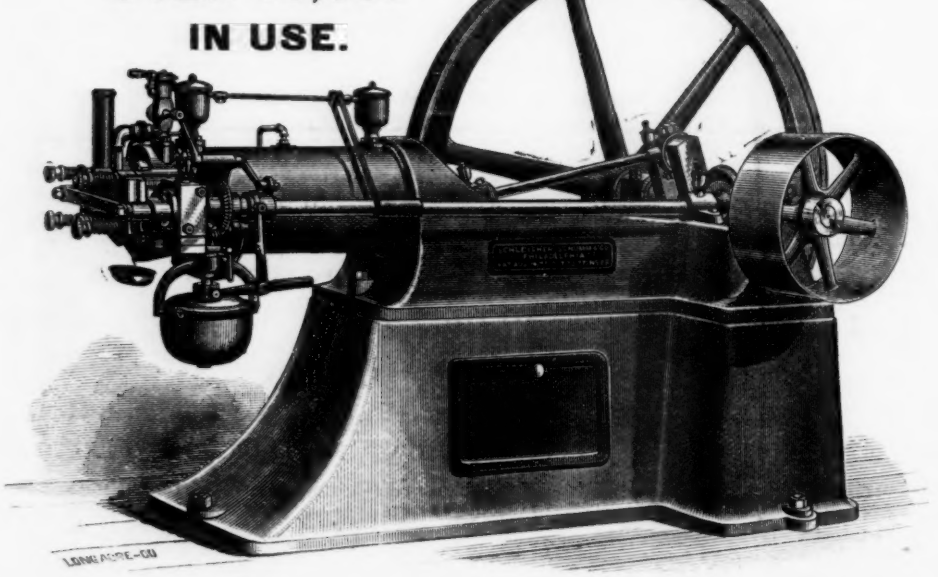

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